Voluntary certification schemes

A case study

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Innovation:	**Voluntary low-carbon building standards**
Intervention:	**BREEAM 2018 New Construction standard (UK)**
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Methodology:	10 interviews, participant observation at 3 industry workshops/conferences, extensive analysis of grey literature
Case Study Overview	
Sector(s):	Steel
Value Chain Stage(s):	Consumption
Type of Intervention:	Social
Date & Duration:	First BREEAM certification was launched in the UK in 1990. Current version for New Construction (under investigation here) launched in 2018.
Location:	United Kingdom. Although other versions of BREEAM are operational in other countries.
Initiating Actors:	BRE (centre of building science in the United Kingdom, owned by charitable organisation the BRE Trust. It is a former UK government national laboratory that was privatised in 1997.)
Actor Constellation:	BRE Group, BREEAM assessors (responsible for building certification, employed externally) BREEAM associates and advisory professionals (employed by project teams to provide advice before, during or after the assessment) Local planning authorities (decide planning permission) UK Government (building regulations) Wider building value chain constellation (architects, developers, owners, tenants, (sub)contractors, suppliers)
Short Description of Intervention:	The building sector is a major consumer of steel, and we therefore focus on the role this sector can play in reducing emissions from steel. In particular, we analyse the role that industry-led, voluntary standards can play in fostering a reduction of 'embedded emissions': a reduction of emissions associated with the construction (rather than operation) of buildings. We explore this through the case of the BREEAM 2018 New Construction certification scheme, which is operational in the UK. BREEAM NC 2018 is a voluntary scheme that assesses the environmental impact of new commercial buildings. One of the nine categories that the scheme assesses is the impact of building materials, which is the focus of this case. There are five ways in which BREEAM 2018 seeks to reduce embodied emissions. These are primarily social/procedural in nature, e.g. the conducting of Life Cycle Assessment and integrating its outcomes in the design decision-making process; responsible sourcing of construction products; and optimising material use. The scheme has the potential to provide a more robust driver for reducing embedded emissions in building: it has increased the number of credits available in the 'materials' category, and requires developers and contractors to consider material impacts in various ways and at different stages of the building process compared to previous versions of BREEAM. The case shows, while much of the discussion around certification and standardisation revolves around the challenges of measuring embodied emissions, the report shows the challenges around measuring whole life embodied carbon are (1) political as well as technical in nature, and (2) only one part of a larger 'implementation puzzle'. However, as the scheme in its current form only came into operation last year, it is difficult to assess its realised impacts.
Research Theme Summaries	
1. Innovation History & Dynamics:	In response to increasing demand for sustainable buildings, a large number of building environmental assessment and green building certification schemes have been created to better identify best practices in green building construction since the 1990s. There are schemes operational on all continents, although most of these schemes only operate in a single country (BREEAM operates in multiple countries, however). To date, BREEAM has been used to certify over 590,000 assessments of buildings across the building life cycle and is being applied in over 78 countries. While many such schemes traditionally focused on operational emissions and impact, BREAM and LEED now also include more extensive

	assessments of embedded emissions. One of the key reasons why this had not been much included to date is due to the difficulty in developing accurate information of embedded emissions at product and building-level.
2. Governance Arrangements & Agents of Change:	As BREEAM is a voluntary scheme, it is up to a building developer to indicate they would like to have their building certified. In order to achieve a high score, the 2018 scheme makes it essential that the choice of materials is considered early in the building process, and communicated to the multiple other actors involved in the construction process, including design team, contractors, and sub-contractors, and should thus foster greater coordination between actors. At the heart of the assessment/certification are independent assessors, licensed by BREEAM, who assess a new building, submit the required information to BREEAM, and ensure that it meets the quality and performance standards of the scheme. Initiatives by cities such as London and the UK Green Building Council and initiatives to achieve a „net zero carbon" built environment, have also helped to shift the focus from operational to embedded emissions.
3. Transformative Capacities:	Two forms of inertia: (1) whether embedded emissions are at all considered, and (2) if they are, if this is subsequently translated into action. Previous versions of BREEAM were said to address neither form. The 2018 scheme has the potential to address (1) by ensuring developers need to consider embodied emissions, which also means suppliers and other stakeholders need to improve the availability and communication of embedded carbon in different products. However, most points in the ‚materials' category in BREEAM are available for considering different material options, not necessarily implementing the lowest-carbon option. It is therefore unclear if BREEAM will address (2). Also, use of timber in buildings is contested not on environmental ground, but safety: recent legislation that prohibits use of some forms of timber in some multi storey buildings may inhibit the uptake of alternatives. As the low-carbon qualities of materials are not yet made very visible and valued, most developers continue to choose steel and concrete in building structures.
4. Assessment & Evaluation:	There are a small number of evaluations of previous BREEAM schemes, although these mostly focus on motivations for choosing BREEAM, rather than (environmental) outcomes. Despite the development of numerous international standards to measure embedded emissions/conduct Life Cycle Assessments, there also continue to be inconsistencies in measuring embedded carbon, which remains one key barrier to developing an evidence base for the impact of BREEAM – or any other initiative – on carbon emission reductions in buildings. This is partly a social/political (rather than technical question) around the attribution of emissions to different parts of the value chain. Numerous interviews said that schemes such as BREEAM may be useful for clients who don't know much about sustainability or have to use it (see drivers discussed below), but may be too restrictive for those who want to be truly innovative.
5. Uptake & Consequences:	Scaling up: there is potential for replication, but most interviewees agreed that voluntary schemes will never be successful in addressing embedded emissions to the extent needed. However, by assigning more credits for use of products that have EPDs (environmental product declarations), BREEAM does have the potential to improve communication of environmental impact of materials further down the value chain, potentially stimulating innovation there. While there was little evidence for additional social or economic impacts, there is a risk that the notion of low- and zero-carbon buildings potentially narrows the notion of sustainable buildings to one that assumes existing political, economic, and social institutions can provide such buildings, rather than requiring more widespread change. Here, the benefit of BREEAM is that developers will need to address multiple (primarily environmental) dimensions, thus also leading to other environmental benefits (e.g. water conservation).
Conclusion & Outlook	
Key Learnings:	*Unique features:* One of a small number of voluntary building certification schemes to consider embedded emissions in construction materials. Requires 'options appraisal', i.e. comparison of different material options, making potential for decarbonisation more legible. However, developers don't necessarily need to act on this to score well in BREEAM, other considerations (e.g. cost) may still be more important. *Key insights from this case regarding …*

	Overall decarbonisation: Direct decarbonisation is difficult to measure. Currently there is no information available (to the author) regarding how much better BREEAM buildings are to non-BREEAM ones, and how much of this possible difference can be attributed to reduction of use of steel (and concrete). *Drivers:* For developers: BREEAM certification as a planning requirement, value increase/higher rent, organisational policy. Technological innovation to measure life cycle emissions has been a driver enabling BREEAM to incorporate embedded emissions in more detail into the standard than before. *Barriers:* Complexity of steel/buildings value chain. Lots of different actors involved, a 'herding cats' problem to get everyone on the same page. E.g. contractors may be incentivised to choose low-cost rather than low-carbon options. In the UK, legislation post-Grenfell disaster both limits use of timber in high buildings, and has (to some extent) led to renewed stigma – developers more reluctant to use it, even if allowed. As a voluntary scheme, BREEAM has to 'move with the market', can't be too far ahead of it or people will not use it. *Instruments to overcome them:* Stimulation of earlier consideration of emissions in buildings/materials meant to ensure those conversations are had between different actors early on, overcoming issue of BREEAM being used as a 'tick box' exercise at the end of the construction process. By stimulating greater development of environmental info (by awarding points for use of products with EPDs), BREEAM stimulates improvement of measurement and provision of environmental data upstream in value chain. *Role of policy:* Most interviewees agreed legislative action is needed. Voluntary schemes alone are insufficient in driving change across the sector. Need updated building standards to drive deep decarbonisation in buildings. Currently, enhanced building regulations are considered by sub-national governments, e.g. Greater London Authority. *Lessons for future innovations:* Most interviewees agreed that previous versions of BREEAM had failed to encourage significant impact (regarding embedded emissions) because it was too easy to use it as a tick box exercise at the end, rather than integrate in decision-making during the construction of building. New version seeks to address this, but too early to tell if successful.
Open Questions & Further Research Requirements:	Further research needed in 2-4 years' time when BREEAM 2018 has been in operation, to see how it has influenced decision-making by developers and other stakeholders. Also: whether improvement of environmental information of products (EPDs, Life Cycle Assessments) will lead to choice of lower-carbon options, or whether other incentives are necessary to do so.

For Europe to achieve its long-term climate objectives, carbon-intensive industries have to reduce their emissions.

REINVENT focuses on plastics, steel, paper and meat & dairy – industrial sectors that are key to our daily lives, but where low-carbon transitions are still relatively unexplored.

To gain a broader understanding of the possibilities of transition, entire value chains of the industries are studied. This includes non-technical factors such as supply chains, financing, trade, and social and economic impacts. Together with forward-looking industry leaders and policy-makers, we explore potentials and capabilities for making transitions in these resource-intensive industries.

PARTICIPANTS & FUNDING

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