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Through the Looking Glass: learning from past experiences towards a more sustainable future.

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Abstract

Taking the conference theme of “Looking at 2026 through the eyes of 2015”, this position paper explores how the implicit principles of weak sustainability, together with the forecasting lens championed in 2015, have influenced the development of a failing sustainability agenda over the last decades. Despite the development of several key national and international guiderails by built environment organisations, and with organisations and actors ostensibly subscribing to such guidance, progress towards meeting the challenges of a sustainable built environment has been slow, particularly with regard to environmental and social issues. Understanding the development of guidance principles and the subsequent strategies enacted in practice gives insights into how future attempts to shift the dial towards a sustainable future might be advanced. Mobilising alternative anticipatory and retrospective thinking, we discuss the vision and pathways which have led to our current state of sustainability and give three scenarios of what ‘might’ have been envisioned had the different principles of strong sustainability and backcasting been mobilised. In doing so, we can recast how 2026 might have looked from 2015 and how a different pathway might have unfolded. We suggest that approaches and models prevalent in 2015, together with a reluctance to revisit prevailing business models, relied on reductionism and fixed deterministic notions of limits and solutions. Our analysis shows that these assumptions have contributed to the divergence between visions of weak and strong sustainability which has brought us from 2015 to 2026. Recasting the future suggests possible ways of re-engaging with the sustainability agenda with a renewed vigour and vision for 2035 and beyond to drive a strong sustainability approach and deliver a sustainable eco-centric built environment that meets the needs of all now and for the future.

INTRODUCTION

Progress towards a sustainable built environment has been slow with many of the changes and transitions being arguably diversionary. This position paper explores how our current trajectory towards a sustainable built environment has been and continues to be shaped, by principles of weak sustainability (which assumes that natural capital (e.g., ecosystems and biodiversity) can be substituted by human-made or financial capital). We explore how this has

led to a focus on somewhat reductionist policies, processes and targets around carbon reduction and global temperature gain, within a business-as-usual landscape. By drawing on alternative debates using a strong sustainability paradigm (which argues that critical natural capital is irreplaceable and must be maintained independently of economic gains), we show how old paradigms have side-lined opportunities to reshape the built environment sector. We sidestep assumptions and debates on net zero, reducing waste, building and city scale modelling and integrated digital systems etc., which stem from forecasting based on principles of weak sustainability and instead focus on a new view of what needs to change over the next decade and beyond to meet the challenges ahead.

The paper is structured as follows; the context and core themes of the emerging and contested sustainable development discourse are introduced, before attention is turned to the current landscape of sustainability in the built environment. The point of departure is then outlined, drawing upon strong sustainability from a backcasting lens, to explore, through the scenario of sustainable housing development, how that may pave the way of improved sustainable development in the built environment.

CONTEXT

As a position paper, rather than synthesizing and critically evaluating existing research, we use literature to develop a historic reflective summary of sustainable development in the built environment. This supports our departure point for the use of backcasting techniques (based on principles of strong sustainability) to examine how we can understand the current sustainable development landscape in the built environment and learn lessons from the past to identify opportunities to strengthen our response to the need for sustainable development in the built environment.

This section outlines three phases of sustainable development and the implications of these for our current progress towards a sustainable built environment.

Pre- World Commission on Environment and Development (Brundtland): The first phase of the movement towards sustainable development raised awareness and concerns at a global level about the need for sustainable considerations and the limits of the environment. This phase started in 1962 with Carson's book "Silent Spring" (Carson, 1962), which demonstrated and documented systemic environmental harm caused by indiscriminate use of pesticides and chemicals. Meadows et al. (1972) followed on with work on growth and ecological limits and the UN Stockholm Conference which recognised that the environment was a global policy issue that had to be addressed (UN, 1973). In 1980 the World Conservation Strategy was launched (IUCN, UNEP, & WWF, 1980) which formally linked conservation with development.

Brundtland and the development of the global targets to avert climate change: the seminal 1987 Report by the World Commission on Environment and Development: Our Common Future in (WCED, 1987) marked the start of a new phase of common understanding and action

towards sustainable development. The report provided the first widely adopted definition of sustainable development as “meeting the needs of the present without compromising the ability of future generations to meet their own needs” (WCED, 1987: 3.27). It also developed concepts of environmental limits to economic growth, the need for balancing between economy and ecology, and the need to consider intergenerational equity. The report signaled the interconnectedness of issues of population, food security, biodiversity, energy, industry, and human settlements, and recognized the need for global action. This call resulted in a global quest for action and resulted in the development of positivist of global targets to avert climate change. From 1987 to 2015, serial developments of accords and international agreements have cemented global targets and adopted limits. The 1992 Rio Earth Summit institutionalised sustainability globally (UN, 1993). This was followed by the 1997 Kyoto Protocol which introduced binding climate targets (UNFCCC, 1997), and the 2006 Stern Review (Stern, 2006) which focussed attention on the economic imperatives for adopting measures to limit climate change and introduced concepts of the low-carbon economy and climate mitigation models. The 2015 Paris Agreement solidified targets for global temperature limits (UNFCCC, 2015). In parallel, and without proposing specific targets, the UN developed goals for global development (the 2000 Millennium Development Goals (UN, 2000) followed by the Sustainable Development Goals (SDGs) (UN, 2015). These goals are represented as a flat, non-relational sustainability framework with 17 areas for sustainable development. The UN encouraged alignment of development projects within these areas. Counter to the trajectory towards target setting and carbon counting, Rockström et al. (2009) proposed the concept of planetary boundaries which expressly challenged the view that growth could continue indefinitely.

The march to meet global and national carbon limits and the rise of an alternative view: The current phase of progress towards sustainable development (with particular respect to the built environment) can be characterised by a march to meet global and national carbon limits as defined by the UN through increasingly tight national and international policies and regulation. Trends have moved from Energy Efficiency to Net Zero, from Energy and Environment to Triple Bottom Line characterisations, the adoption of Building (Environmental) Assessment Tools and (since 2015) compliance with sustainable development goals. This increasingly reductionist view of sustainable development has been arrived at through a process of forecasting global targets to mitigate climate change and the adoption of principles of weak sustainability to meet these targets. This has led to an increasingly difficult discourse between the need for growth and the requirement to husband resources and limit emissions. Indeed, the flat non-relational pick and mix approach approach to adopting the SDGs seem to rather miss the main thrust of earlier reviews from Brundtland and Rockstrom where the real challenge of limits and reform came into focus.

Over this phase the movement supporting the Planetary Boundaries approach has grown with Raworth’s (2017) seminal work around Doughnut Economics thinking, the 2021 Monte Verità Declaration (IEA, 2021), and the 2024 Planetary Boundaries Update (Rockström et al. ,2024).

Taken together, these inform the movement towards strong sustainability which understands that economic and environmental capital are complementary but not interchangeable. This approach to sustainability relies on a rethink of how the built environment can be developed within these constraints to foster planetary limits, creating tension with the SDGs' "integration" logic, which treats economic growth, social inclusion, and environmental protection as mutually reinforcing rather than hierarchically constrained. Alternative concepts/models emerging around strong sustainability emphasise biodiversity, nature centrality and regenerative approaches. This connects with the need to move from doing less harm to doing no harm, towards doing good (net positive), recognising intrinsic value of the environment and giving nature a seat at the table.

CURRENT LANDSCAPE OF SUSTAINABILITY IN THE BUILT ENVIRONMENT

Drawing upon three key developments, the following section mobilizes the concepts of weak and strong sustainability as lenses through which to understand the current sustainable development landscape in the built environment.

Meeting any definition of sustainable development in the built environment is challenging – regardless of the focus on strong or weak sustainability. It is becoming harder to be optimistic about meeting the target-focused emphasis on zero carbon and its associated challenges as 2030 approaches, with targets consistently missed or extended. This focus detracts from the broader intellectual debates of strong sustainability and how our perspectives, political appetites for adaptation and reform of our built environment need be challenged in order to meet planetary limits and constraints in the built environment. The focus of sustainable development in the built environment has so far been to meet global and nationally agreed limits with increasingly narrowing policies and standards. These include building certification schemes (e.g. BREEAM (BRE, 1990), LEED (USGBC, 1998) etc.); sustainable construction policies and standards (e.g. DETR, 2000; European Parliament and Council, 2010); Net Zero standards and frameworks (UKGBC, 2019; CIBSE 2024); carbon accounting frameworks (e.g. whole life carbon measurement (RICS, 2023), and circular economy policies (Mayor of London, 2021, etc).

Three themes encapsulate current sustainable development processes in the UK built environment: Net Zero, building assessment and circularity, and alignment with Sustainable Development Goals. We present a UK focused summary of each of these themes, highlighting what was understood in 2015, how this framed development, and what has changed.

From Energy Efficiency to Net Zero

Earlier efforts on energy efficiency are immediately consistent with our representation of weak sustainability - trying to do things a little less badly than the day before. Net Zero could be argued as a step in the right direction, explicitly recognising an environmental limit and the need to do no harm. Unfortunately, the latest IPCC assessments point to the likely need

to move towards negative carbon approaches, not just neutrality (IPCC 2022). Blanket adoptions of Net Zero as the be all and end all of sustainability also neglect the complex systemic nature of the environmental challenge and the need to keep all environmental impacts within the frame of reference. The term itself has also become problematic, though recent politicisation of the concept lies outside the scope of our current work.

Strong progress has been made in the UK with increasing energy efficiency and reducing carbon emissions; however actual changes continue to fall short of ambition. This drive has been articulated progressively as a tightening of UK Building Regulations Part L (HM Government, 2013), an oscillating approach to commit to a target of Net Zero by 2050 (HM Government, 2019), the UK Government 2025 Planning and Infrastructure Act (HM Government, 2025)) and the Future Homes Standard (HM Gov, 2026). The effects of these tightening targets are to continue the idea that building more zero carbon homes is a sustainable pathway, despite adding to the UK's embodied and operational carbon emissions and the annual building of approximately 200k new homes (MHCLG, 2025a). The global situation is even bleaker with minimal changes in energy efficiency, albeit some more promising growth in electrification and the adoption of renewable energy (UNEP 2025). The sector has grappled with particular challenges around the performance gap between design standards of buildings and actual performance, as well as slow progress in retrofitting existing buildings with shortfalls in funding available and delivery capacity (UKGBC 2025).

From Building Assessment to the Circular Economy:

Early development of building standards locked in many of the hazards of weak sustainability, once again reflecting steps to do things a little less badly than the day before, while also encouraging concentration on individual aspects in isolation. Building (Environmental) Assessment Tools have been developed and implemented to classify, design and measure new and existing buildings. Energy Performance certificates and standards are used to determine levels of acceptable performance for our existing and future building stock, which has in part led to the stranding of building stock where performance falls below acceptable limits, but where costs of refurbishment to acceptable standards are uneconomic. Although The situation has improved as we have collectively developed a more nuanced understanding of sustainability with existing standards seeking a more holistic focus and new standards emerging, our reliance on these standards continues (Gulácsy, 2020).

Recognition of the importance of circular economy principles has been growing and is approaching understanding of the tenets of strong sustainability. Despite the growing discourse, many of the real-world initiatives in this area are either at pilot or early stages, as seen with recent initiatives recorded by UKGBC (2025). UNEP (2025) indicate a similar picture globally with a growing number of cities adopting roadmaps and embedding circular economy principles in legislation. Circular economy approaches can still fall short of a deep reflection of strong sustainability, perpetuating a reliance on extracted materials, focussing on recycling

rather than maintaining material value and remaining isolated from matters of social inclusion or nature centrality.

From 2020 the circular economy has become tightly linked to net-zero strategies and ESG reporting, through the lens of supply-chain resilience and security. It seems that forecasting towards meeting carbon reduction targets has resulted in the development of tighter requirements for energy use in homes but has restricted the debate on how to build fewer homes, reusing housing stock and maintaining stores of finite raw materials.

From the Triple Bottom line to SDGs.

The triple bottom line concept is all but synonymous with weak sustainability. It has all too often been represented as meaning that a balance must be struck between environmental, social and economic requirements and led to compromises and sacrifices being made, all too often with economic priorities trumping the other areas.

Substantial efforts have been made, not just in the UK construction sector but by global business and finance, to move towards a more sustainable footing and it has been commonplace to embed principles of the triple bottom line and SDGs when developing CSR / ESG practices. National and international policies have evolved to require project scope to align with specific or nominated UNSDGs and this approach has been extended into project funding and institutional frameworks. The UNSDGs do not set targets but seek positive action towards satisfying the goals and have been described as promising sustainability without abandoning growth and too internally inconsistent to guide real policy change (Hickel, 2019)..

In summary, the current approach to sustainable development which relies on forecasting to achieve perceived targets derived from weak sustainability views of carbon reduction have failed to reform the long-term sustainable future of our built environment. What is missing is a different approach which uses concepts of strong sustainability to reimagine what reform of the sector might look like.

APPROACH

As a position paper, this work does not employ a traditional research methodology. Instead, it draws on relevant literature and scholarly debate to develop and justify the position advanced in the paper. This section uses critical literature synthesis to compare forecasting and backcasting approaches before giving an illustrative backcasting scenario analysis.

In order to reimagine we need to see things outside the current frame and to “see” beyond the horizon. The following section outlines the twin lenses of forecasting and backcasting and sets the scene for a scenario where backcasting (Dixon & Tewdwr-Jones, 2021) is used to illustrate a scenario for “absolutely sustainable” development within the built environment based on principles of strong sustainability.

Forecasting is the process of estimating future conditions or outcomes based on the analysis of past and present data, combined with assumptions about how key factors are likely to change. The approach has been critiqued for reproducing existing trends, failing in non-linear systems and confusing statistical models with real-world uncertainty (Makridakis & Taleb, 2009). Flyvbjerg's study of megaprojects (2014) criticised forecasting for normalising overconfidence in targets and performance and understating risk and uncertainty. This approach has moved the debate from Brundtland's broad review of the principles of sustainable development to simple proxy measures of carbon emissions and energy use. Forecasting has been a key driver for limits and targets on energy use, codes and standards for increased efficiency and reducing carbon emissions, performance.

Conversely, backcasting is part of the broader "foresight" approach (Dixon & Tewdwr-Jones, 2021) but distinct from forecasting. The major distinguishing characteristic of backcasting is how a desirable future can be attained. Backcasts are not intended to reveal or indicate what the future is likely to be. Rather, they indicate the relative feasibility and implications of different policy goals from a particular desired future endpoint to the present. This allows exploration of the nature of that future, what policy and other measures would be required to reach that point (Robinson, 1990). The process of backcasting depends on contested values and political unfeasibility which are often under-addressed (Meadowcroft, 2011), with Höjer and Mattsson (2000) asserting that backcasting is appropriate where current trends are leading towards an unfavourable state.

BACKCASTING SUSTAINABLE HOUSING DEVELOPMENT: SCENARIO DEVELOPMENT AND DISCUSSION

This section recasts how 2026 might have looked from 2015 and how a different pathway for sustainable housing development might have unfolded. We critique how forecasting lenses have impacted the UK housing development sector, discuss increasingly different views and then offer three scenarios which help illustrate the developing arguments.

The UK housing development sector is typically framed in terms of the weak sustainability paradigm, with siloed and reductionist thinking. The dominant narrative (mobilised by national housing developers and government alike) is of a need for more 'units', a relaxation of regulation, a release of land and isolated lip service to the UNSDGs. The repeated mantra of a lack of 'units' built reflects a deeper systemic structural tension and fragile financial systems. There are ongoing debates in terms of 'units', currently framed around a requirement of 300,000 new homes annually (Homes England, 2025). That target is seen as an underestimation by the National Planning Policy Framework (MHCLG, 2025b) and locations remain hotly debated. In terms of planning, the system is often described as inefficient and overly regulated. Yet an alternative perspective highlights the system complexities that shape sustainable development. Certainly, the repeated changes to the planning system (enacted to make the process of unit building more efficient) have not resulted in sustainable housing

development delivery, further supporting the argument that the challenge is beyond siloed adjustment within a flawed system (Holman & Mace, 2026).

There is growing recognition (alluded to by the New Towns Taskforce Report to Government (MHCG, 2025c)) that the core sustainability challenge facing the sustainable housing development sector is in fact system structure, where the structural system seems not fit for purpose in terms of sustainability. Certainly, the UNSDGs were not envisaged to be mobilised to meet one goal at the cost of others. What is needed is a vision of the challenge and scale of thinking across an interconnected global system. Within this context, and using backcasting, sustainable development for the built environment could have been re-imagined in 2015 to be built on principles of working with nature not separating oneself from it, with dramatically different pathways and results.

In order to bring this into focus, in terms of backcasting we now offer three simple yet interconnected scenarios within the context of the housing development sector.

Firstly, in 2015 forecasting encouraged stakeholders to focus on improving energy efficient boilers and install smart meters in each new build. This is about energy efficiency and decarbonisation. Forecasting approaches led us to aim for iterative improvements, seeking to make gas boilers more efficient (effectively mandating condensing boilers), encourage more efficient user behaviour through smart meters and energy performance certificates and improve the energy efficiency of homes through a variety of policy measures to improve fabric energy efficiency, which have seen mixed success. By contrast a backcasting approach would invite consideration of a future that has moved away from fossil fuel and towards much greater use of passive approaches to condition internal environments. This could have informed a much higher ambition in the environmental performance of new builds, driven earlier focus on heat pumps and raised questions around skills and capacity for transforming the existing housing stock. Similarly, a backcasting approach that considered future readiness would have enshrined the need for measures to ensure that buildings are fit for a future climate.

Second, our forecast led approach has been to start from an assumed number of new units required, and then, led generally by developer, smear these around local authorities and available land. By contrast backcasting approaches would seek to develop a placemaking approach by envisaging the kind of communities we want to create. This would place a much greater emphasis on issues such as building a sense of community, aligning with much greater nature centrality. Rather than seeing nature as a blocker to adding more units we need to be assessing how we enable a fit home for nature within any expansion of the "built" environment.

Finally, in terms of social infrastructure for housing development, forecasting approaches have led to social infrastructure being added on as a negotiation between planners, developers and investors, heavily mediated by frameworks such as Section 106 (HM

Government, 1990) and the Wellby Index (HM Treasury, 2021), with the risk that schools, shops, GP surgeries etc are left to last by developers or not delivered at all. A backcasting approach that builds towards the future we want to bring about would bring such essential infrastructure to the front and grow developments around them.

These simple scenarios embedded within a housing development context illustrate the shortcomings of our current siloed, reductionist approach to sustainability which is firmly entrenched in a structural system built upon weak sustainability principles and mobilised through forecasting. As such, the question is ‘how can we backcast now, in 2026, to an envisaged future of perhaps 2035 or even 2050 whilst drawing upon principles of strong sustainability?’.

SUMMARISING THOUGHTS

Indications point to the unavoidable conclusion that current approaches to tackling sustainability are not enough. The current structural system is flawed and approaches to tackling the sustainability challenges are similarly flawed. By using a backcasting lens to envisage and make sense of new ways of achieving sustainable development at regime and landscape levels, the structures of current issues within the built environment can be considered. It seems vital that rather than considering themes in isolation, they can be reframed as interconnected issues which have roots in the same ecosystem of biosphere, society and the economy. It is no longer enough to polish the same broken system (derived from egocentric thinking and embedded in weak sustainability), but rather it is time to embrace a holistic and strong view for sustainable development in the built environment.

By taking the theme of “looking back to look forward” we have shown that continuing to draw on models of the past to inform policy and decisions may not lead us towards a sustainable built environment. Without a freedom to think freely, we will remain trapped in a continuing spiral of tightening regulations and targets which are proxies for real transition to sustainable development. Taking a stacked model of strong sustainability and relating that to the knotty problems of sustainability in the built environment, will allow new ways of recasting the problems of today.

Our exploration of the complexities of landscape level reform builds on Kohler et al.’s (2019) assertion that niches can scale, regimes can shift but not result in absolute reductions in resource use or emissions without landscape transformation of policy and legitimacy. Whilst transition work using MLP has focused on regime level transformations, we argue that environmental constraints in terms of carrying capacity and limits should be considered as landscape level actants rather than adjustments to be made at the regime level together with power and policy issues. If we are going to do anything meaningful by 2050, we must learn the lessons of the past. We must imagine what we want 2050 to look like and create changes at regime and landscape levels to make them happen over time. This involves numerous stakeholders including academics pressing for change through research.

This is a first pass at scoping an alternative trajectory for sustainable development in the built environment. It is, by its nature, limited to a reflective review and subjective scenario development. We acknowledge that backcasting based on strong-sustainability paradigms faces political, institutional, commercial, and implementation barriers. Further work must follow, exploring different paradigms and challenging our vision of the future enabling better understandings of how emerging technologies, developing business models and institutional logics might be recast. That recasting will provide real commercial opportunities for those able to think outside the box, driving a strong sustainability approach to deliver a sustainable ecocentric built environment. This analysis helps to deepen our imperfect understanding of the rate of advancements towards sustainable futures against our ability to meet our environmental and societal commitments. In Alice's words, "You can't change the past, but you might learn something from it".

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