

PAS 2080:2023

Carbon management in buildings and infrastructure



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Published by BSI Standards Limited 2023

ISBN 978 0 539 18034 3

ICS 13.020.01

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Publication history

First published May 2016

Second edition March 2023



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Foreword

The revision of this PAS was commissioned by the Green Construction Board Infrastructure Working Group as part of the Construction Leadership Council. Its development was sponsored by the Institution of Civil Engineers and funded by:

- Anglian Water Services Ltd
- Arcadis
- Arup
- Atkins
- Costain
- Department for Transport
- Environment Agency
- Institution of Civil Engineers
- IPA
- Jacobs
- Mott MacDonald
- Stantec
- UK CARES
- WSP in the UK

Its development was facilitated by BSI Standards Limited and it was published under licence from The British Standards Institution. It came into effect on 31 March 2023.

Acknowledgement is given to Mott MacDonald and Arup, who provided technical authors, and the following organizations that were involved in the development of this PAS as members of the Steering Group:

- Alliance for Sustainable Building Products
- Anglian Water
- Arup
- Department for Energy Security and Net Zero
- Department for Transport
- Environment Agency
- HS2
- Institution of Civil Engineers
- Mott MacDonald
- National Grid
- Scottish Government
- Skanska
- Stantec
- Targeting Zero LLP
- Tarmac Ltd
- UCL
- WSP in the UK

Acknowledgement is also given to the members of a wider review panel who were consulted in the development of this PAS.

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Supersession

PAS 2080:2023 supersedes PAS 2080:2016, which is withdrawn.

Information about this document

This is a full revision of the PAS, and introduces the following principal changes.

- Expanded scope to include all the built environment (buildings and infrastructure), with a focus on behaviours and good practice principles intended to complement existing standards/guidance.
- Clarifications to the role of value chain members with control of and influence on whole life carbon in the context of a net zero transition and systems-level change.
- Increased emphasis on a whole life carbon, aligned with a 1.5 °C global warming, circular economy principles, and the urgent need to decarbonize systems, networks and assets, while balancing capital carbon investment with operational and user benefit.
- Inclusion of requirements specific to procurement and to aid decision-making in projects and programmes of work.
- Consideration of other demands and co-benefits when managing carbon, such as climate adaptation and biodiversity net gain.
- More emphasis on the importance of leadership, governance and collaboration across the value chain and beyond, including guidance for government, regulators and financiers.
- Features to encourage consistent approaches across the built environment industry to collectively manage whole life carbon and support the net zero transition, while not conflicting with other existing standards, accreditation schemes, procurement notices, or similar.

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It has been assumed in the preparation of this PAS that the execution of its provisions will be entrusted to appropriately qualified and experienced people, for whose use it has been produced.

Presentational conventions

The provisions of this PAS are presented in roman (i.e. upright) type. Its requirements are expressed in sentences in which the principal auxiliary verb is “shall”.

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

Where words have alternative spellings, the preferred spelling of the *Shorter Oxford English Dictionary* is used (e.g. “organization” rather than “organisation”).

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Executive summary

At a time of a global climate emergency and with an international agreement to transition to a net zero carbon economy by or before 2050, PAS 2080 outlines a carbon management process that is applicable across both infrastructure and buildings, recognizing that they have key commonalities and are part of an interconnected system – the built environment. By following the PAS 2080 approach, value chain members across the built environment can work collaboratively towards the common goal of net zero carbon transition and achieve the following outcomes:

- align buildings and infrastructure projects and/or programmes of work, at the asset, network or system level, to the net zero transition by or before 2050, and therefore contribute to limiting global warming to 1.5 °C, as per Paris Climate Agreement 2015;
- reduce carbon and increase value across the whole life of buildings and infrastructure; and
- remove silos and create collaborative ways of working that promote innovation, encourage positive change for society and support economic development.

The 2013 *Infrastructure carbon review* [1] recognized the opportunity to create wider benefits through managing carbon in a consistent manner across the value chain. PAS 2080 was first published in 2016 and outlines a practical process to realize low-carbon outcomes. Its principles and claims of conformity have been adopted by several infrastructure organizations and, increasingly, developers and local authorities.

Targeted at leaders and all members of value chain organizations (asset owners/managers, designers, constructors and product/material suppliers) responsible for delivering built assets and networks, PAS 2080 provides a common process for the built environment value chain on how to manage whole life carbon in projects and programmes of work. PAS 2080 promotes reduced carbon, increased value delivery, more collaborative ways of working, and a culture of challenging convention and traditional practice for decarbonization.

PAS 2080 includes requirements for all value chain members to show leadership and establish effective governance mechanisms for reducing whole life carbon through a common management process. The individual value chain requirements are structured around:

- effective leadership;
- maximizing opportunities for whole life carbon reductions at all stages of the delivery process;
- selecting appropriate carbon emissions assessment methodologies;
- setting appropriate carbon reduction targets;
- determining baselines against which to assess carbon reductions;
- establishing metrics (e.g. key performance indicators – KPIs) for credible carbon emissions monitoring and reporting;
- integrating carbon management into procurement; and
- continual improvement of carbon management and performance.

PAS 2080 also sets out guidance for other value chain members – government, regulators and financiers – to illustrate the key roles these organizations play in the net zero transition, particularly to change behaviours. These are presented in Annex C.

The PAS is supplemented by the *Guidance document for PAS 2080*, which provides further practical guidance on how to implement the different requirements of this PAS and addresses current good practice through worked examples and case studies.

0 Introduction

0.1 The aim of PAS 2080

PAS 2080 is a specification for whole life carbon management when delivering projects and programmes in the built environment. The PAS supports the transition to a net zero carbon economy by 2050 and requires close collaboration across value chain members. It defines their contribution towards the net zero transition by developing and implementing, in a collaborative manner, the PAS 2080 carbon management process.

0.2 Buildings, infrastructure, and greenhouse gas emissions

Recently, there has been a step change in political and public perception of the impacts from climate change and environmental degradation. The urgency for action has been universally agreed with the COP21 Paris Agreement. At the time of writing (2023), national governments and the private sector are gearing up for transitioning to a net zero carbon world by or before 2050 that is also resilient to the unavoidable changing climate and enhances biodiversity net gain.

Consequently, the challenge for buildings and infrastructure (also referred to as “built environment” in this document) has shifted: work on every existing and new asset needs to contribute towards the urgent transition to net zero carbon. This requires a step-change transformation at the system level, driven collaboratively by all value chain members.

To date, carbon management in buildings and infrastructure has been largely managed separately. There are industry differences in terminology used to describe emissions sources (e.g., capital vs embodied carbon) and their materiality; there are different standards that buildings and infrastructure professionals use to assess whole life carbon; and different definitions for the stages of delivering projects and programmes work, among other differences. There has also been limited understanding of the carbon implications of land use change, circular economy principles, and the loss of ecosystems and biodiverse habitats. While PAS 2080 recognizes such differences in infrastructure and buildings, as the World Green Building Council points out, “infrastructure and buildings share key commonalities and are interdependent in use – it is important that we consider them together as part of a system” [2]. Accordingly, decarbonization should be carried out in alignment with net zero transition.

To better align the way decarbonization is managed in buildings and infrastructure, PAS 2080 sets some overarching principles to drive whole life carbon reduction, focusing on behaviours and good practices instead of specifics covered elsewhere. Some terms that are used to describe sources of emissions, for example, might more be familiar to buildings practitioners, while other terms might be more familiar to infrastructure practitioners. To provide clarity and avoid duplication, the terms and definitions use in this PAS are defined in Clause 3.

The *Infrastructure carbon review* [1] and PAS 2080:2016 focused on the whole life carbon of all economic infrastructure and differentiated between carbon in the control and influence of asset owners/managers. Since then, the decarbonization principles have continued to mature.

The review of the UK’s progress on decarbonization, published almost eight years after the *Infrastructure carbon review* [1], accentuated the need for the following actions (which have directly informed the scope of PAS 2080:2023):

- focusing on whole life carbon both within the control and influence of asset owners/managers, not just in creating assets, but also in their future operation and use;
- considering assets as part of complex, interconnected networks and systems;
- taking into account and integrating the carbon implications of climate resilience, environmental regeneration and biodiversity; and
- recognizing that most of the built environment expected to exist in 2050 is already built and has locked in high carbon behaviours, hence the need for retrofitting to decarbonize established built environment systems.

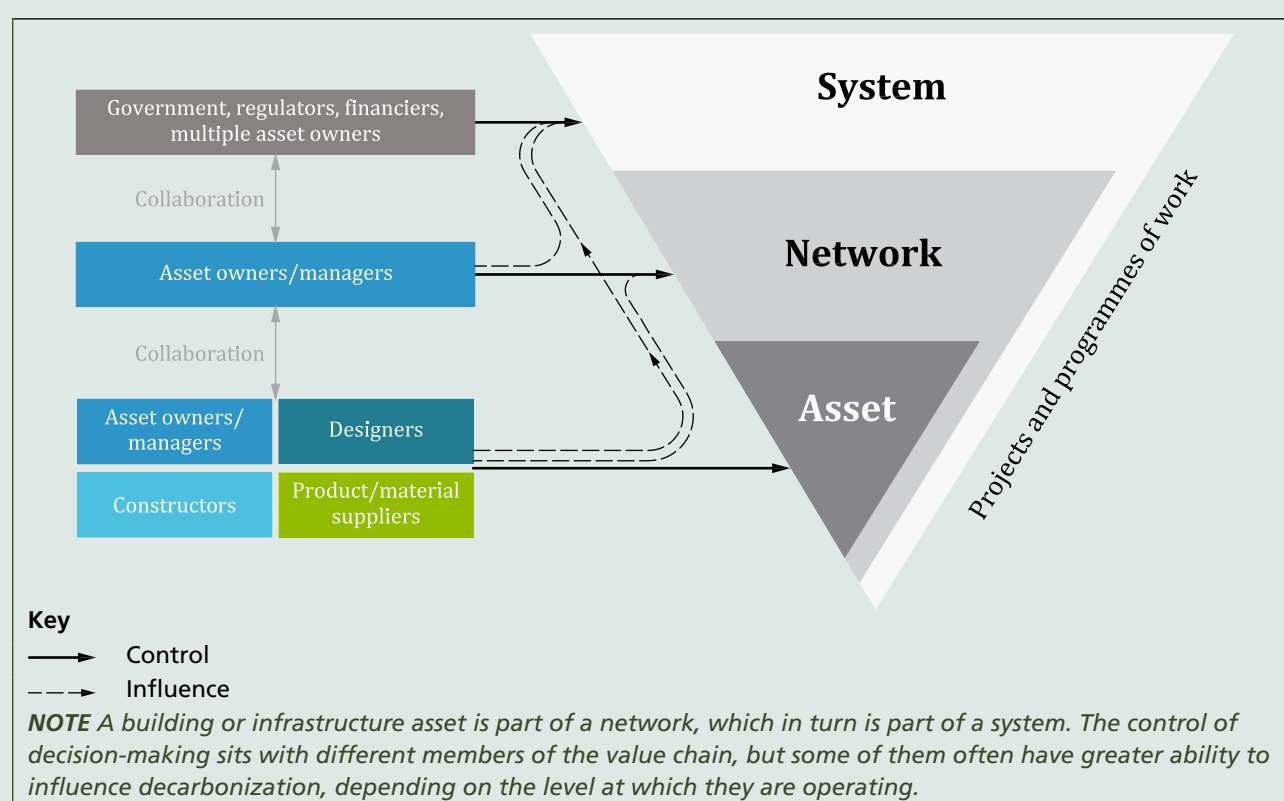
0.3 From assets to networks and systems

In the context of a net zero transition, it is essential that decarbonization is addressed from the system level downwards and through close collaboration across the value chain. PAS 2080 acknowledges this systems approach when setting out carbon management requirements and recognizes it is typically governments and regulators who have the greatest control at the system level – and, in some specific cases, major asset owners/managers.

Figure 1 graphically outlines the nested relationship of an asset within a network and a wider system, and the level of control and influence each member of the value chain has to drive whole life carbon reductions, recognizing that projects and programmes of work can be undertaken at each level.

PAS 2080 also recognizes that whole life carbon assessment is an essential part of managing to reduce carbon. Clarification is provided in Clause 4 and worked examples in the *Guidance document for PAS 2080* to drive the right behaviours and principles for decarbonization by all value chain members.

Figure 1 – Relationships between value chain members across assets, networks and systems



0.4 Decarbonization, resilience and environmental restoration

In striving for net zero, it is important that the value chain, especially asset owners/managers, recognize the complex interdependencies and synergies between decarbonization, other emergencies (e.g., climate adaptation, biodiversity loss), as well as the social and economic priorities in each context.

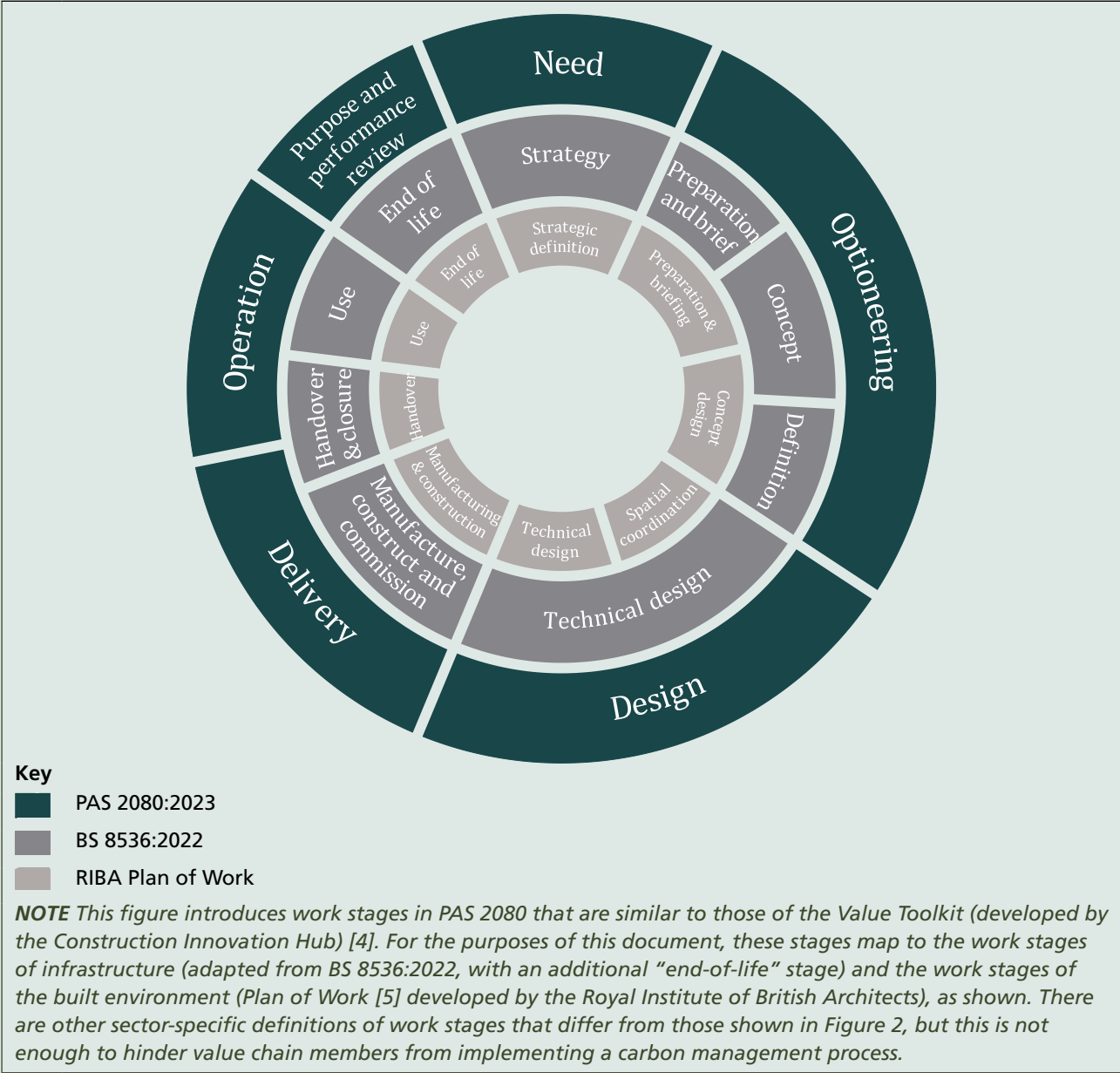
It is important that projects and programmes of work in the built environment address these challenges in a holistic way. The carbon management process outlined in PAS 2080 provides a systematic way to allow value chain members to place the relevant criteria (for the future benefit of our planet and society) at the centre of decision-making.

Further clarification on how to consider these aspects as part of the carbon management process is included in Clause 4 and Clause 6, and in worked examples provided in *Guidance document for PAS 2080*.

0.5 Consistency in the built environment

Adopting consistent language across different sectors will help with resonating the principles of the carbon management process with all value chain members and stakeholders. Figure 2 proposes a unifying approach to compare well-established work stages in infrastructure and buildings, and indicates the terminology used in this document.

Figure 2 – Unifying work stages for projects and programmes of work



1 Scope

This PAS specifies requirements for the management of whole life carbon in buildings and infrastructure – in the provision, operation, use and end of life of new projects and/or programmes of work, as well as the management or retrofit of existing assets and networks.

PAS 2080 is a specification to:

- a) align the built environment with the transition to a net zero carbon economy by 2050;
- b) encourage wider uptake of carbon management across the built environment;
- c) promote close collaboration between all members of the value chain;
- d) recognize the importance of systems in transitioning to net zero, clarifying the role of each value chain member to control and influence decision-making;
- e) streamline consideration of influencing carbon beyond the project/programme boundaries;
- f) emphasize the importance of the carbon reduction hierarchy for whole life carbon reduction;
- g) take into account whole life carbon and circular economy principles when delivering/operating new or maintaining/repurposing/retrofitting existing assets/networks; and
- h) integrate co-benefits and other emergencies/priorities as part of the carbon management and decision-making processes.

The scope of the PAS is summarized in Table 1.

Table 1 – PAS 2080 scope

PAS 2080 is about	PAS 2080 is not about
Managing carbon to reduce whole life emissions in the built environment, aligned with the net zero carbon transition and recognizing the importance of balancing climate adaptation and circular economy principles to bring wider co-benefits.	How to conduct a detailed appraisal of wider sustainability or environmental aspects ¹⁾ .
Consistency in the process of carbon management, including target setting, opportunities identification, assessment, use of data, procurement, continuous improvement, monitoring, reporting, leadership, governance and collaboration for decarbonization.	Prescriptive greenhouse gas (GHG) quantification/assessment methodologies and data gathering, as this is already addressed in other standards/specifications.
Consistency in framing whole life carbon reduction, both within the control and influence of the value chain.	GHG reporting against national accounts or a compliance methodology.
Decarbonization for increasing value: driving whole life carbon reduction that is compatible with the net zero carbon transition.	Whole life cost management or prescriptive guidance on how to manage decarbonization at national level.
Demonstrating capability for integrating carbon in decision-making when delivering projects and/or programmes of work, whether at asset, network or system level.	Organizational or corporate ESG (environmental, social and governance) certification.

¹⁾ While this standard is not about environmental or sustainability appraisals, it is important that the carbon implications of climate adaptation, biodiversity net gain and nature-based solutions are fully taken into account in the delivery, operation, use and end of life of projects and/or programmes of work. Failing to evaluate them together might risk conflict and unintended consequences across the systems.

Table 1 – PAS 2080 scope

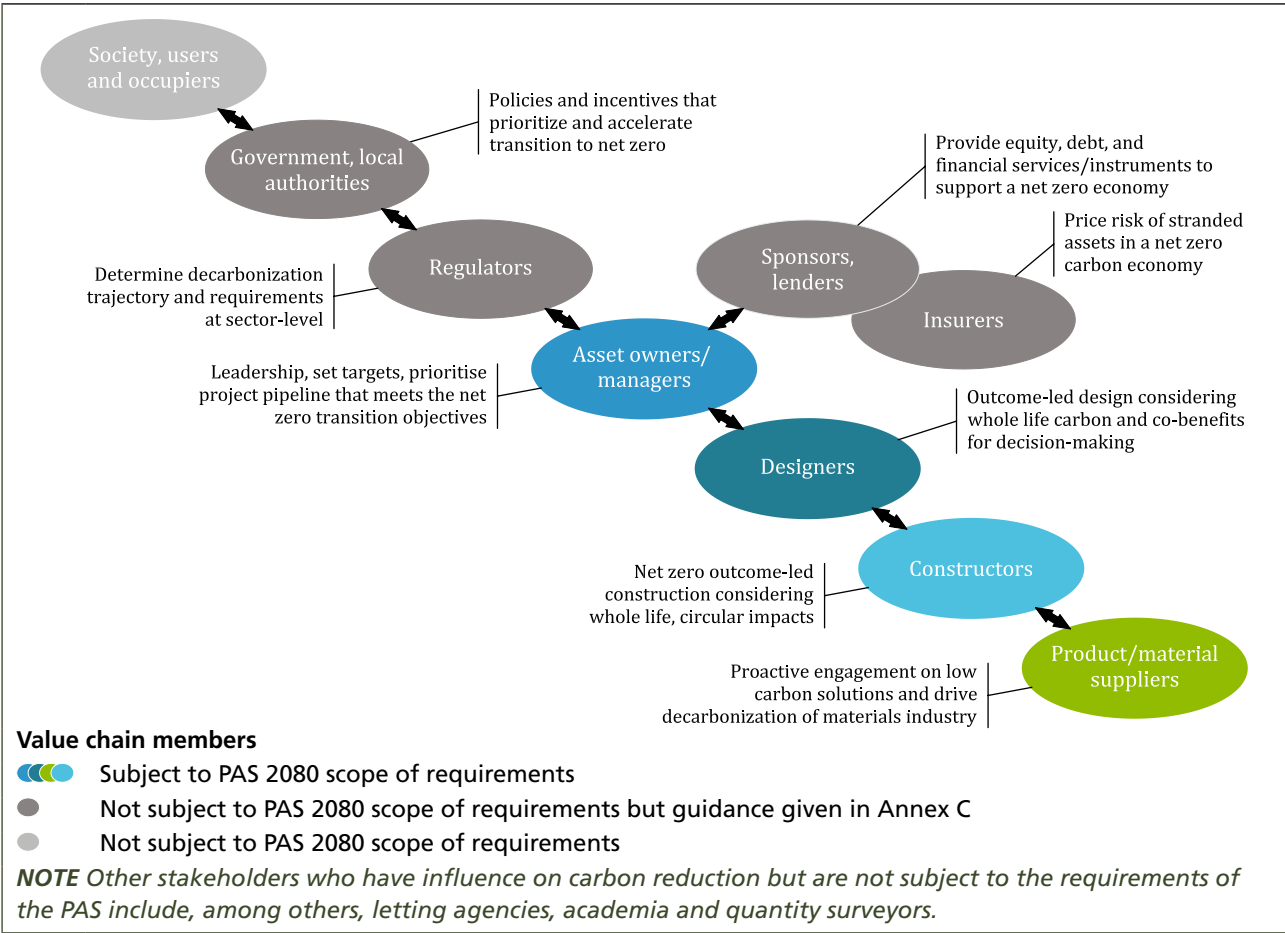
PAS 2080 is about	PAS 2080 is not about
Highlighting the importance of government, regulators and financiers in implementing decarbonization in projects and/or programmes of work.	Setting prescriptive regulatory or investor requirements and KPIs.

The concepts of systems thinking and co-benefits (e.g., climate adaptation, nature-based solutions) are being continually refined and applied. Although PAS 2080 is focused on carbon management, it recognizes the importance (for all value chain members) of addressing these concepts in the context of a project or programme of work and the associated risks or co-benefits of any intervention (see Clause 4 for further context and *Guidance document for PAS 2080* for worked examples).

Although asset owners/managers have the primary responsibility for implementing a carbon management process, all value chain members share responsibility for the management of the associated carbon emissions and removals during the delivery of projects and/or programmes of work. Asset owners/managers can only realize the intended reductions within a fully integrated value chain involving designers, constructors and product/material suppliers, together with regulators and financiers who influence climate-related policy, planning and regulation.

Figure 3 reflects the relationships across the value chain in the built environment and their roles in carbon management. While PAS 2080 does not set requirements for government, regulators and financiers, this revision acknowledges their importance in influencing decision-making in the built environment by providing additional guidance, in Annex C, on the role they can play in the net zero transition.

Figure 3 – Value chain members in the built environment and their roles in carbon management



To help each value chain member contribute effectively, the responsibilities set out in each clause of this PAS are arranged under the following headings.

- 1) Requirements for all value chain members.
- 2) Asset owner/manager requirements.
- 3) Designer requirements.
- 4) Constructor requirements.
- 5) Product/material supplier requirements.

Practitioner roles in each value chain member include strategic planning, procurement, design, construction, operation, maintenance, use and end of life.

The PAS includes requirements for developing a carbon management process built around the following components.

- i) Decarbonization principles (Clause 4).
- ii) Leadership (Clause 5).
- iii) Integrating carbon management into decision-making (Clause 6).
- iv) Whole life carbon assessment principles to support decision-making (Clause 7).
- v) Target setting and baselines (Clause 8).
- vi) Monitoring and reporting (Clause 9).
- vii) Procurement (Clause 10).
- viii) Continual improvement (Clause 11).
- ix) Claims of conformity (Clause 12).

In addition to the clauses of this PAS, the informative annexes include guidelines on the following topics.

- Categories of emissions and removals to aid decision-making for reducing whole life carbon (Annex A).
- Applying the carbon management process (Annex B).
- Guidance for government, regulators and financiers (Annex C).

To successfully claim conformity with the requirements of this PAS, each value chain member is required to declare the role(s) they undertake (from the above responsibilities list). They can then demonstrate conformity with the clauses under the “requirements for all value chain members” heading and those under other headings pertaining to their role(s) – refer to Clause 12 for further details.

To achieve conformity, value chain members are to evidence relevant organizational capability appropriate to the point(s) of delivery at which they are involved. This includes alignment with the principles outlined in Clause 4 and demonstrating their capability to deliver decarbonization in the built environment.

NOTE Value chain members can claim conformity with PAS 2080 as:

- an asset owner/manager;
- a designer;
- a constructor; or
- a product/material supplier

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this PAS, the following terms and definitions apply.

3.1 activity

set of actions that consume time and resources and whose performance is necessary to achieve, or contribute to, the realization of one or more outcomes

[SOURCE: PD ISO/IEC TR 24766:2009, 3.1]

3.2 activity data

data based on a unit quantity of input or output of the studied system or a process within it

NOTE Activity data can be a physical quantity such as mass (kg), a unit of cost (£), or a unit of energy (kWh).

3.3 asset

physical entity forming part of a network and/or system that has potential or actual value to an organization and its stakeholders

NOTE For the purpose of this document, buildings are regarded as assets. They are serviced by infrastructure networks, which combined form different systems as part of the built environment.

3.4 asset owner/manager

organization that manages and is responsible for providing, operating and maintaining a buildings and infrastructure network or asset(s)

NOTE Typically the asset owner/manager is the asset owner, but on occasion an asset owner/manager might also be the organization charged with operating buildings or infrastructure, a project sponsor, a service provider, a developer, a financier, the entity undertaking project works, or the organization charged with providing services from buildings and infrastructure.

3.5 baseline

scenario for what carbon emissions and removals would have been in the absence of planned measures aiming to reduce emissions

NOTE Emissions and removals are separate parts of the baseline and calculation of emissions reduction only refers to the baseline emissions.

3.6 building

structure, usually enclosed by walls and a roof, constructed to provide support or shelter for intended occupancy

[SOURCE: BS ISO 19880-1:2020, 3.7]

3.7 built environment

collection of human-made or induced physical objects located in a particular area or region

NOTE When treated as a whole, the built environment typically is taken to include buildings, external works (landscaped areas), infrastructure, and the products of construction works within the area under consideration.

[SOURCE: BS ISO 15392:2019, 3.5]

3.8 capital carbon

GHG emissions and removals associated with the creation and end-of-life treatment of an asset, network or system, and optionally with its maintenance and refurbishment

NOTE 1 GHG emissions associated with maintenance and refurbishment are included as “optional” under the capital carbon definition because they could also be defined as “operational carbon” emissions, depending on the chosen assessment methodology. The selected terminology is to be clarified as part of the assessment methodology process (see Clause 7).

NOTE 2 PAS 2080 recognizes the use of the established terms “embodied carbon” and “upfront carbon” by parts of the industry (in accordance with existing life cycle assessments standards and guidance) to refer to similar stages of a whole life carbon assessment. For the purpose of PAS 2080, “capital carbon” is the selected terminology to allow comparison/alignment with the cost management/expenditure profile of projects and/or programmes of work (see Note 3). The selected terminology is to be clarified by the practitioner (as described in Clause 7) and considered in the context of the PAS 2080 whole life carbon framework for decision-making in Clause 4.

NOTE 3 As defined in the Infrastructure carbon review [1], capital carbon can be alternatively defined as the GHG emissions associated with the scope of capital expenditure defined in accordance with the asset owner’s preference.

3.9 carbon budget

estimated amount of whole life carbon a system can emit

NOTE Carbon budgets are usually set at the system level and are aligned to national or international net zero targets or other decarbonization trajectories defined at the system level.

3.10 carbon dioxide equivalent (CO₂e)

unit for comparing the radiative forcing of greenhouse gases (GHGs) to carbon dioxide

NOTE The carbon dioxide equivalent is calculated using the mass of a given GHG multiplied by its global warming potential (see 3.25).

[SOURCE: BS ISO 14064-1:2006, 2.19 modified – note 2 deleted]

3.11 carbon management

assessment, reduction and removal of greenhouse gas emissions during the planning, optioneering, design, delivery, operation, use, end of life (and beyond) of new, or the management of existing, assets, networks and/or systems

3.12 carbon offset

discrete reduction in greenhouse gas emissions not arising from the defined subject, made available in the form of a carbon credit meeting a defined set of requirements (as per PAS 2060:2014) and used to counteract emissions from the defined subject

NOTE Offsets can be generated via a variety of activities, including those that avoid or reduce emissions and those that remove carbon from the atmosphere. Additional information on offset categories is available in the Oxford principles for net zero aligned carbon offsetting (2020) [6].

[SOURCE: PAS 2060:2014, 3.7 modified – original note removed, new note added]

3.13 carbon reduction

process of minimizing greenhouse gas emissions in the development of new, or the refurbishment of existing, assets or networks

NOTE The outcome of carbon reduction process is a quantified reduction in existing sources of GHG emissions or the avoidance of GHG emissions.

3.14 circular economy

economy that is restorative and regenerative by design, and which aims to keep products, components and materials at their highest utility and value at all times, distinguishing between technical and biological cycles

NOTE Circular economy principles can be applied across all work stages of projects and/or programmes of work to assess materials/products in terms of reuse and recycling potential after end of life, as well as their flexibility in being repurposed or retrofitted whilst satisfying the whole life performance required from their respective assets and networks.

[SOURCE: BS ISO 20400:2017, 3.1]

3.15 co-benefits

added benefits of decarbonization, above and beyond the direct benefits of reducing greenhouse gas emissions

NOTE Examples of co-benefits include, but are not limited to, reduced air pollution, increased resilience, reduced cost and risks, employment possibilities, security, social justice, nature restoration and regeneration, and biodiversity net gain.

3.16 constructor

entity that undertakes work to construct, build, maintain, repair, replace, disassemble or demolish an asset or network

NOTE A constructor can be an asset owner/manager or a product/material supplier.

3.17 control

ability of value chain member to make decisions about activities that leverage carbon emissions and removals

NOTE 1 This could include either operational decision-making power and/or financial decision-making power.

NOTE 2 Details of which value chain members, including regulators and financiers, have control or influence when working on an asset, network or system level are provided in Annex C.

3.18 decarbonization

process by which organizations, sectors or other entities aim to achieve zero fossil carbon emissions, typically referring to a reduction of the carbon emissions associated with key sectors, such as electricity, industry and transport

3.19 designer

entity that creates, prepares or specifies the design of an asset or network that is to be constructed, maintained, repaired or refurbished

NOTE A designer can be an asset owner/manager, consultant, constructor or product/material supplier.

3.20 emissions factor

amount of greenhouse gases emitted, expressed as carbon dioxide equivalent (CO₂e) and relative to a unit of activity

[SOURCE: PAS 2060:2014, 3.7 modified – note removed]

3.21 emissions reduction

quantified decrease in greenhouse gas emissions specifically related to or arising from an activity between two points in time or relative to a baseline

3.22 end of life

stage which begins when the asset has reached the end of its design life and is ready for refurbishment, retrofit, disposal, dismantling, etc., and ends when the asset is recycled, reused, recovered or returned to nature (combustion, deterioration)

NOTE The process for setting study boundaries and assessing end-of-life emissions follows an appropriate standard or methodology, as described in Clause 7.

3.23 financier

investor (individual or organization holding equity or debt categorized as financial assets, including but not limited to asset owners, asset managers and banks) and lender (individual or organization that loans money to a borrower to finance consumption or investment, on the expectation of repayment on contractual terms, usually within a stated period and with interest payment)

[SOURCE: ISO 14097:2021, 3.7 modified – to include separate definitions for investor and lender from same source]

3.24 functional unit

quantified performance of a product or system for use as a reference unit

NOTE The functional unit takes into account a function, a quantity, a duration, and a quality of the asset, network or system being assessed. Refer to the Guidance document for PAS 2080 for further explanation and examples of functional units.

[SOURCE: BS EN ISO 14044:2006, 3.20 modified – note added]

3.25 global warming potential (GWP)

factor describing the radiative forcing impact of one mass-based unit of a given greenhouse gas relative to an equivalent unit of CO₂ over a given period of time

[SOURCE: BS ISO 14064-1:2006, 2.18 modified – note deleted]

3.26 greenhouse gases (GHGs)

gaseous constituents of the atmosphere, natural and anthropogenic, that absorb and emit radiation at specific wavelengths within the spectrum of infrared radiation emitted by the Earth's surface, the atmosphere and clouds

NOTE 1 Throughout PAS 2080, the term “carbon” is often used (e.g., capital carbon, user carbon, operational carbon). This is applied as shorthand for “GHGs” (or the equivalent CO₂e) as defined by the UNFCCC Kyoto Protocol [7].

NOTE 2 The UNFCCC Kyoto Protocol [7] (and Doha Amendment) seven main greenhouse gases include carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF₆) and nitrogen trifluoride (NF₃).

[SOURCE: BS ISO 14064-1:2006, 2.1 modified – original notes deleted and new notes added]

3.27 greenhouse gas (GHG) assessment

process of calculating the total amount of GHG emissions and removals due to the delivery, use, operation, maintenance, demolition and/or reuse of assets and/or networks

NOTE The principles of quantification and reporting GHG emissions in the built environment differ from Scopes 1, 2 and 3 defined by the Greenhouse Gas Protocol [8], and adopted by the Science Based Targets initiative (SBTi) [9], typically used in the corporate sector (e.g. companies' sector, organizations, institutions). Although there are commonalities in certain terminologies and principles, a whole life carbon approach is used for the purpose of carbon management and driving decarbonization in the built environment (buildings and infrastructure).

3.28 greenhouse gas (GHG) emission

total mass of GHG released to the atmosphere over a specified period of time

[SOURCE: BS ISO 14064-1:2006, 2.5]

3.29 influence

ability of value chain member to support other value chain members to make low-carbon decisions

3.30 infrastructure

basic physical and organizational structures, facilities, equipment and services needed for the operation of a society or organization, or the services and facilities necessary for an economy to function

NOTE Assets (infrastructure assets and buildings) are part of networks (e.g. municipal pipes and manholes are part of a water network). The combination and interaction between networks (e.g. transport, drainage, water, energy, telecommunications) form built environment “systems” (see 3.49).

[SOURCE: ISO/TR 19231:2014, 3.5 modified – expanded to cover equipment, note added]

3.31 leadership

ability of an individual, group or organization to lead, influence or guide other individuals, teams or entire organizations

3.32 life cycle

consecutive and interlinked stages of a product, equipment or service, from raw material acquisition or generation from natural resources to design, production, transportation/delivery, use, end-of-life treatment and final disposal

NOTE A whole life cycle carbon assessment is only one of the components of the carbon management process. As further described in Clause 7, existing standards for life cycle assessment do not cover all elements of the PAS 2080 whole life carbon framework for decision-making (Clause 4), hence value chain members are to assess carbon influenced outside the direct project/programme boundary to inform decision-making (i.e. emissions/removals within the study boundary [see 3.48]).

[SOURCE: BS ISO 37100:2016, 3.1.12 modified – expanded to cover equipment, note added]

3.33 nature-based solutions

actions to protect, sustainably manage and restore natural or modified ecosystems that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits

NOTE Nature-based contributions to decarbonization could be by: 1) providing infrastructure services (e.g. flood protection, urban cooling) and avoiding the need for capital and operational carbon from the equivalent grey/hard infrastructure (e.g. flood defences, air conditioning); 2) actively removing carbon from the atmosphere by enhancing natural ecosystem diversity and re-instating the natural carbon cycle, hence increasing carbon sequestration in the above ground vegetation (e.g. trees) and the soil that supports it. Worked examples are provided in the Guidance document for PAS 2080.

[SOURCE: Cohen-Shachman et al. [10]]

3.34 network

combination of interconnected assets (buildings and infrastructure) that provide services (e.g. water, power, transport) to society as part of a wider system

NOTE Asset owners/managers are typically responsible for a network and have control over its delivery, operation, use and end of life.

3.35 net zero

reduction of anthropogenic greenhouse gas emissions to zero or to a residual level that is consistent with reaching net zero emissions in eligible 1.5 °C pathways (hence time-bound) and neutralizing the impact of residual emissions (if any) by removing an equivalent volume of carbon

NOTE 1 A net zero target is normally set at the system level reflecting national and/or international decarbonization trajectories to align to an eligible 1.5 °C pathway.

NOTE 2 Net zero differs from carbon neutrality (as defined in PAS 2060:2014), as net zero is focused on reducing whole life emissions and using removals to balance out residual emissions within a certain timeframe, whereas carbon neutrality relies on carbon offsets and does not necessarily support whole life carbon reduction. PAS 2080 has been developed to bring together value chain members across the built environment to work collaboratively towards the common goal of net zero carbon transition by 2050, hence does not include carbon neutrality as part of its scope.

3.36 operational carbon

greenhouse gas emissions and removals associated with the operation of an asset, network and/or system required to enable it to operate and deliver its service

3.37 organization

company, corporation, firm, enterprise, authority or institution, or part or combination thereof, public or private, that has its own function and administration

3.38 practitioner

member of the value chain responsible for contributing to the successful implementation of a PAS 2080-compliant carbon management process, including strategic planning, procurement, programme manager, operator, designer/technical advisor, construction manager, material/product developer, environmental or sustainability manager

3.39 product/material supplier

organization that extracts, manufactures and/or produces materials or products for incorporation into works to construct, build, maintain or operate an asset or network

3.40 programme of works

defined set of projects related to the construction, maintenance, operation and/or end of life of an asset, network or system

NOTE A programme of works is a combination of two or more projects.

3.41 project

unique process, consisting of a set of coordinated activities and controlled resources undertaken to achieve certain objectives that can take place at the asset, network or system level

[SOURCE: BS ISO 21931-2:2019, 3.22 modified – expanded to include resources]

3.42 project/programme boundary

physical, process, temporal and geographical limits of a project or programme of work

NOTE 1 The “project/programme boundary” in PAS 2080 is typically referred to as “system boundary” in life cycle assessment standards. PAS 2080 does not use the same terminology, as existing standards do not address the systemic thinking required when making decisions from carbon reduction in projects and/or programmes of work in the built environment [see “system” definition (3.49) and Clause 4 for further details].

NOTE 2 For emissions beyond the project/programme boundary and its life cycle, refer to definition of “study boundary” (3.48).

3.43 regulator

government or authority (e.g. country, state, city council, planning authority, highway authority, government department) which owns the regulatory applications of a specific sector or area, which serve as principles, policies or rules governing or prescribing the behaviour of users as well as the provisioning of goods, services and/or rights interchanged

NOTE Regulators are responsible for setting targets at a system level (as per Clause 8). Asset owners/managers are expected to engage with regulators and other relevant asset owners/managers to influence policy-making as part of the carbon management process. Refer to Clause 4 and Annex C for further information.

3.44 removal

withdrawal of a greenhouse gas from the atmosphere and stored as a result of deliberate human activities

NOTE Removals are arbitrarily used to refer to either natural processes or technological solutions.

[SOURCE: IWA 42:2022, 3.3.3 modified – original notes removed and new note added]

3.45 residual level

greenhouse gas emissions from a project or programme of work that remain unabated in a specific year after carbon reduction measures have taken place

NOTE As described in Clause 4, it is important that carbon reduction targets (as defined in 3.50) are consistent with the level of residual emissions in the year of national or sector-specific net zero in 1.5 °C-aligned mitigation pathways.

3.46 resources

something that lies ready for use or that can be drawn upon (material and non-material) for aid or to take care of a need

3.47 sector

collection of organizations involved in the delivery and operation of assets for the purpose of providing a service (e.g. energy, water, telecommunications)

3.48 study boundary

physical, process, temporal and geographical limits of activities to assess GHG emissions and removals

NOTE 1 A project or programme of works falls within the study boundary, however the study boundary can be equal to or greater than the project/programme boundary. The assessment of GHG emissions and removals at a wider study area helps with understanding the project or programme of works' impact on the wider network or system.

NOTE 2 Throughout PAS 2080, the term “boundary” is often used as a shorthand for “study boundary” unless specified.