

Definition of Net Zero Infrastructure

Infrastructure Forum workshop summary

Contents

1.0	Key Headlines	<i>page 2</i>
2.0	Introduction & Background to Workshop	<i>page 3</i>
3.0	Summary of Workshop Discussions	<i>page 4</i>
4.0	Conclusions and Next Steps	<i>page 7</i>

Infrastructure Coalition

The UKGBC is part of an infrastructure [industry coalition](#) set up to support the UK transition to a net-zero GHG economy by 2050. The coalition was formed in 2019 by Mott MacDonald and includes Skanska and The Carbon Trust, amongst others. This workshop has been developed in collaboration with the above organisations and is part of a series of work packages aimed to help inform industry and Government on *how* to deliver infrastructure in line with the net-zero 2050 target.

1.0 Key Headlines

The key headlines from the Workshop discussions are as below

Framework Definition

- An industry-agreed Framework Definition is important in driving more intentional, collaborative and focussed action
- A strong emphasis on measurement, transparency and public disclosure is required for the transition period and to build trust and collaboration across the industry
- The Whole Life Carbon of infrastructure projects must be assessed, but with the recognition regarding the scope of emissions that can be directly controlled (Capital and Operational Carbon) versus those that can be influenced (End-User Carbon)
- It is critical to understand the interdependencies and enablers between the carbon scopes, materiality issues and the lifecycle of the infrastructure
- All stakeholders across the supply chain must be empowered and engaged – to do so, the boundaries of ownership and influence across the lifecycle must be clearly defined early on for each stakeholder
- PAS 2080 should be used to encourage a common terminology across the Framework Definition and in Industry
- Ongoing performance monitoring and measurement will be crucial to the success – consistent metrics must be defined for the Framework Definition

Key questions to take forward

- What is the best approach to *defining* the scope of boundaries for each project?
 - How can the transition period towards net zero be considered, given the dependencies of certain sectors on others?
 - How can a project best map out the interdependencies and enablers across the carbon scopes, materiality issues, lifecycle of the infrastructure and ownership within the value chain?
 - How can the continued monitoring and progress of any project be verified?
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2.0 Introduction & Background to Workshop

2.1 Introduction

UKGBC held an Infrastructure Forum workshop on Tuesday 21st July 2020 to explore if a clear definition for Net Zero Infrastructure is required to reach the UK's net zero target by 2050, and if so, how this might best be approached. This paper sets out the headline statements that came out of the workshop discussions and proposed next steps.

2.2 Background: Net Zero by 2050

The UK government has legislated to cut greenhouse gas emissions to net-zero by 2050. With a planned infrastructure pipeline of >£600bn over the next decade, the decarbonisation of the infrastructure sector will be critical in reaching this target.

[Previous UKGBC studies](#) indicated that greater clarity is required in defining and delivering an agreed net zero infrastructure target which organisations and projects can work towards. Central to this challenge is whether a clear definition of net zero across the infrastructure industry currently exists, and if not, how this might be approached.

Any definition would also need to complement existing work relating to this area, including: The Infrastructure Carbon Review, which provides sector specific definitions of whole life carbon emissions, and PAS 2080, which provides a framework of how individual members of the infrastructure value chain can systematically reduce whole life carbon emissions.

Why is this important?

- There is currently a huge diversity of approaches that have been adopted by infrastructure organisations seeking to demonstrate leadership in this area
- As such, there is not yet full consensus on how net zero for the organisations, existing assets and future projects, that make up the infrastructure sector should be defined
- This can create uncertainty for stakeholders in the infrastructure value chain, from investors and assets owners, to main contractors and suppliers – which may lead to a fragmented and disordered transition to delivering a net zero infrastructure sector

What do you mean by 'definition'?

- UKGBC published the '[Net Zero Carbon Buildings: A Framework Definition](#)' in April 2019, which set in place a path to achieve net zero carbon buildings in both construction and operation
- This was an important step in building a consensus around how best to collaboratively work towards a net zero built environment, with the definition being applicable and accessible regardless of the building or user type (e.g. new, retrofit or existing – to developer, tenant, design team, owner-occupier, etc.)
- The workshop sought to explore whether an Infrastructure equivalent would be valuable for the industry, and if so, whether a similar Framework approach or structure would be appropriate

2.3 Workshop Structure

The workshop involved breakout discussions with plenary feedback, exploring the following questions:

- ***How important is it to have a clear Net Zero Carbon Infrastructure framework definition that is applicable across the different sectors? I.e. in achieving UK's 2050 Net Zero target?***
- ***If yes, how should the boundary of the definition be set in a way as to avoid unintended consequences? E.g. Operational Carbon, User Carbon, End-User Carbon***
- ***Should the scope cover economic and social infrastructure?***
- ***How do we ensure the net zero framework definition for infrastructure is applicable to all members of the value chain and different sectors/sub-sectors?***

Attendees included: commercial clients, contractors, engineering consultancy, government agencies, utilities, investors, utilities, academics, and sustainability specialists.

3.0 Summary of Workshop Discussions

Q1 How important is it to have a clear Net Zero Carbon Infrastructure framework definition that is applicable across the different sectors? I.e. in achieving UK's 2050 Net Zero target?

There was general agreement that it is important to have a Framework Definition that is applicable across the different sectors. **An average importance score of 4.4** was given across the five breakout groups, on a scale of 1 to 5, with 1 being *Not Important* and 5 being *Critical* in achieving UK's 2050 net zero target.

Key discussions points were:

<p>General</p>	<ul style="list-style-type: none"> • An industry-agreed definition is important in driving more intentional, collaborative and focussed action • The target for Net Zero by 2050 is clear, but translating this to both a project design level and ownership level requires greater clarity across the industry – in particular, the scope and methodology in achieving net zero should be consistent • The Net Zero Building Framework was very helpful in the absence of a government framework definition – there is a gap for a similar process and guidance for Infrastructure with the recognition that there would be a much greater emphasis on embodied carbon for Infrastructure works • It was noted that although there is demonstrated appetite within the industry to tackle the net zero challenge, the terminology used in discussions across the stakeholders and sectors have largely not been consistent to date
<p>Benefits</p>	<ul style="list-style-type: none"> • A Framework Definition would reduce the risks of greenwashing • Provide a central basis to communicate around, particularly with broader stakeholders • Provide stakeholders less carbon-literate the confidence in joining the discussion • Help mobilise finance for green infrastructure projects and a disclosure of process for measuring and monitoring progress
<p>Development & Implementation Considerations</p>	<ul style="list-style-type: none"> • Needs to be applicable across the industry and to provide clarity across the supply chain stakeholders on their ownership, responsibilities and influence • The Framework Definition must be robust, but not narrow-focussed as this will restrain innovation and the advancement of solutions in both process and product • Broader environmental, social and human considerations must also be taken into account • The transition period towards net zero should be considered, as should the dependencies of some sectors on others decarbonising – does this mean that some assets should be net zero balanced from the beginning and others on a trajectory? • There should be a strong emphasis on measurement, transparency and public disclosure • It needs to complement or be integrated with existing guidance, such as PAS2080

Q2 How should the boundary of the definition be set in a way as to avoid unintended consequences? E.g. Capital / Embodied Carbon, Operational Carbon, End-User Carbon

There was a consensus that the Whole Life Carbon (WLC) of infrastructure projects should be considered, but with recognition regarding the scope of emissions that can be directly controlled (Capital and Operational Carbon) versus those that can be influenced (End-User Carbon). The suggested approach in *defining* the scope for each project varied and is therefore an area for further exploration.

Key discussion points:

<p>Approach to defining the scope for each project</p>	<p>General</p> <ul style="list-style-type: none"> • Cannot make the scope too narrow or focus on only one measurement metric – an oversimplification can have unintended consequences and adverse impacts across the broader net zero context • Must agree what can be considered <i>reasonable</i> simplification to prevent the process being too complicated. Noted that this has been achieved in other frameworks or schemes, such as ESOS and the NZCB, whereby defining the boundary was the first step in any process • Critical to understand the interdependencies and enablers between the carbon scopes, materiality issues and the lifecycle of the infrastructure – treat infrastructure carbon as a ‘system of systems’ – any framework definition needs to promote this cross-working. • Consideration to the stage of appraisal required – the net zero definition is part of a trajectory towards net zero. Full consideration must also be applied to the existing infrastructure. <p>Bottom-Up</p> <ul style="list-style-type: none"> • Take a modular approach by building-up from Capital, Operational to End-User • Development of a visual tool with a ‘menu’ of possible scopes (and ownership of roles) to help explicitly define the scope at the beginning of each project or discussion • Use PAS 2080 / ICR categorisations as a starting point, with additional categories, e.g. flood defences <p>Top-Down</p> <ul style="list-style-type: none"> • Use the PAS 2080 approach of assuming a maximum scope, then reduce this based on items that do not make a material difference • The onus would be on the stakeholder applying this approach which would provide a degree of flexibility for the evaluation • Map out the key interconnectivities at the beginning to identify and prioritise the critical items
<p>Importance of End-User Carbon</p>	<ul style="list-style-type: none"> • Must be included within the Framework Definition given its magnitude • Better understanding of how End-User Carbon impacts on the CapCarb and OpCarb and vice-versa is critical, especially given the long lifespan of most infrastructure • Appreciation that there is a circular relationship within the Infrastructure sector on driving for change, particularly between Asset Owners and UK Government – but emphasis is on maximising and convening influence, i.e. do not provide stakeholders a loophole to <i>not</i> address their scope of influence with regards to End-User Carbon
<p>Industry-wide Considerations</p>	<ul style="list-style-type: none"> • Asset Owners are critical stakeholders for new build given their scope and influence to ‘build less’ as a first consideration • Not all projects can necessarily achieve net zero, so the broader sector and industry collaboration is required to consider this – is it possible to encourage those who <i>can</i> go ‘further’ to do so? • Must understand clearly the wider system impacts, interplay and whole-life value add, e.g. a heavy carbon project that perhaps unlocks carbon savings in other parts of the economy

Q3 Should the scope cover economic and social infrastructure?

There was a general agreement that whilst all economic and social infrastructure is important towards the UK 2050 Net Zero goal, for the purpose of the Framework Definition there can be a distinction made given that buildings are already covered by the NZCB Framework. It was noted however that a full scope will help government and organisations to plan more effectively, but also to better consider the relationship from a broader perspective.

It was suggested that a mapping exercise be carried out to ensure that all types of infrastructure are covered by a definition and have a consistent and/or complementary approach. This would help highlight the interdependencies across social and economic infrastructure, and clearly define to wider stakeholders and the industry what is covered under the various ‘umbrella’ terms. In turn, this will help drive more effective target setting and performance monitoring on a sectoral basis.

Q4 How do we ensure the net zero framework definition for infrastructure is applicable to all members of the value chain and different sectors/sub-sectors?

Given the breadth of the value chain and sectors involved within the infrastructure industry, this discussion presented the most ‘questions’ and considerations to explore going forward.

<p>Transition considerations</p>	<ul style="list-style-type: none"> • Critical to empower and bring in all stakeholders across the supply chain – to do so, the boundaries of influence across the lifecycle must be clearly defined for each stakeholder • New assets should be built to zero capital carbon and enable operational carbon • ‘Waypoints’ should be provided to help understand what ‘good’ looks like • The whole supply chain should be mapped in its current status to understand whether the right supply chain exists – and are engaged • Broader supply chain engagement through training and skills development is critical, not just the provision of technical guidance • From a materials standpoint, it would be helpful to assess what net-zero compatible materials can be developed going forward
<p>Implementation considerations</p>	<ul style="list-style-type: none"> • Scope 1, 2 and 3 emissions are defined differently for the corporate value chain than it is for Local Authorities • PAS 2080 is useful in providing a common terminology for the industry to use and in identifying how various stakeholders can contribute towards the management of carbon – this should be built upon • Regulators should be brought into the conversations to better understand the role they can play in enabling a ‘level playing field’ • Consideration should be given to procurement and commercial arrangements that can provide incentives down the value chain • Critical to define the ownership and level of influence early on to ensure efficient and effective collaboration
<p>Monitoring considerations</p>	<ul style="list-style-type: none"> • Transparency and public disclosure are crucial for the transitional period and in building trust and collaboration within the industry • A top-down approach should be used for any target setting to ensure alignment with the overall UK context • Performance monitoring and measurement is critical – consistent metrics must be defined for the Framework Definition • How can any performance be verified? Is there a role for third-parties, such as CEEQUAL or GRESB Infrastructure?

4.0 Conclusions and Next Steps

The workshop clearly emphasised the need for a Framework Definition for the Infrastructure sector in its transition to net zero by 2050. It is critical that any work done has buy-in and agreement from stakeholders from across the value chain in order to have significant uptake.

Key questions highlighted by the workshop discussions to take forward include:

Key questions to take forward

- What is the best approach to *defining* the scope of boundaries for each project?
- How can the transition period towards net zero be considered, given the dependencies of certain sectors on others?
- How can a project best map out the interdependencies and enablers across the carbon scopes, materiality issues, lifecycle of the infrastructure and ownership within the value chain?
- How can the continued monitoring and progress of any project be verified?

4.1 Next Steps

UKGBC and the Infrastructure Coalition are currently still discussing how best to take this work forward, including discussing the various components of work, the timescales and process of engagement.

Given the breadth of sectors and stakeholders that would need to be involved in future work, we would welcome any further thoughts or expression of interests on this subject matter. To stay informed of any updates or further workshops, please email Emily.Huynh@ukgbc.org to be placed on the UKGBC Infrastructure Forum mailing list if you are not already on this.