



Uchelgais
Gogledd Cymru
Ambition
North Wales

ARUP

A Summary of our
Methodology

**Reducing Carbon
Emissions and
Improving Biodiversity
in Growth Deal Projects**



Foreword



Alwen Williams
Portfolio Director | Ambition North
Wales

Climate Change is one of the planet's most complex and messy issues and we all play a role in mitigating its affect through acting now to stop or minimise factors that exacerbate it, and adapt how we go on living in a world that is affected by it. Continuing with a 'Business as Usual' mindset is simply not good enough.

The North Wales Growth Deal has been signed at a time when countries globally are grappling with the urgent need to dramatically cut greenhouse gas emissions while also addressing species extinction and biodiversity loss. There are substantial opportunities for North Wales and the Growth Deal in this changing landscape, particularly around green energy production, low carbon manufacturing and the circular economy, food production and tourism. With our natural resources, diverse economy and resourceful population, we see a positive and promising future for the region.

Yet, the built environment is responsible for almost 40% of carbon dioxide (CO₂) emissions, generated through the construction and operation of buildings and infrastructure, which continue to increase.¹ The Welsh Government goal is for all buildings to operate at net zero emissions by 2050. However, this does not fully address the carbon emissions generated through the lifetime of the infrastructure asset – the extraction of building materials, its transport, construction, operation; and ultimately its demolition and disposal.

All Growth Deal projects have an infrastructure element and therefore our projects could inadvertently *increase* regional carbon emissions and biodiversity loss, despite pledges by local authorities across North Wales to avoid doing so and, contrary to UK and Wales national targets. Our Ambition North Wales regional partnership is fully committed to build on the local authority pledges and push towards sustainable development, reducing carbon emissions and mitigation of biodiversity loss, and we will do this through each of our Growth Deal projects by working towards the following targets:

- Zero operational carbon - when operational the projects will not emit more greenhouse gases than they absorb
- 40% less embodied carbon - which will cut the carbon created when the projects are built and when they are decommissioned
- 10% net benefit for biodiversity - which means improved biodiversity than before the project.

By committing to the ambitious targets and robust approach set out in this guidance document, we are clearly demonstrating our intention to minimise this risk – and also pledging to maximise the valuable opportunities coming from it for North Wales. Through application of this approach, we will drive regional innovation, job creation and training and help deliver on the vision of a prosperous, sustainable, low carbon future for Wales.

¹ UNEP 2019 [Global Status Report for Buildings and Construction Sector](#)

The approach set out in this document will help projects cultivate a mindset where we can deliver on our goals of job creation and regional investment, while minimising damage to the biodiversity, landscape and fresh air that underpin so much of the economy of North Wales – our agriculture, our tourism and the land we all call home. Adopting this mindset early offers the opportunity to build costs into design, helping projects save money by “doing things differently” as well as saving carbon.

I believe this approach is bold and ambitious. It will be challenging and I’m sure we will learn by doing – which will only help us to deliver gains in the long term. It is an example of North Wales leading where other regions can follow and benefit from everything we learn along the way. I whole-heartedly recommend this approach to you and your project teams.

A handwritten signature in black ink that reads "Alwen Williams". The script is cursive and fluid, with the first letters of "Alwen" and "Williams" being capitalized and prominent.

Alwen Williams
Portfolio Director

1. An overview of our approach

In March 2021, the North Wales Economic Ambition Board pledged that North Wales Growth Deal projects will meet the targets described below:

- **Zero operational carbon** – when they're running the projects won't emit more greenhouse gases than they absorb
- **40% less embodied carbon** – which will cut the carbon created when the projects are built and when they're dismantled
- **10% net benefit for biodiversity** – which means better biodiversity than before the project.

These are ambitious targets, and go beyond current regulations. They're important, though, because they'll:

1. Make sure Growth Deal project infrastructure is ready for the future, and
2. Create jobs and training in North Wales to prepare our workforce for a low-carbon future.

We've worked with Arup to create a methodology that gives practical, step-by-step guidance to help Growth Deal projects consider emissions and biodiversity at every stage. This document summarises our methodology, with full details available by contacting info@ambitionnorth.wales.

2. Why are these targets important?

We're in a climate and ecological emergency.

Carbon emissions from human activity are heating our planet, causing devastating changes to our climate and weather.

Biodiversity losses from modern industrial solutions are causing large-scale species extinctions. Our natural systems are on the verge of breakdown – risking our food supply, medical care and more.

In North Wales:

- Our seas will rise. By 2080 sea level in Llandudno is predicted to be 38cm higher.
- We'll have more storms, rainfall and flooding putting people at risk in low-lying places like Llanrwst, Kinnel Bay, Deeside industrial estate and Fairbourne.
- We'll see more extreme temperatures including longer and hotter heatwaves.
- Flooding and heat, as well as increased pests and diseases, will make farming harder and reduce biodiversity even further, affecting our food production in the region.

Buildings and infrastructure are a big part of the problem: 40% of global carbon emissions come from building construction and operation.

For Wales to meet its climate targets, buildings will need to operate at close to zero emissions by 2050. We'll need to use much less energy in buildings and transform how we heat and power them, relying on low carbon and renewable energy.

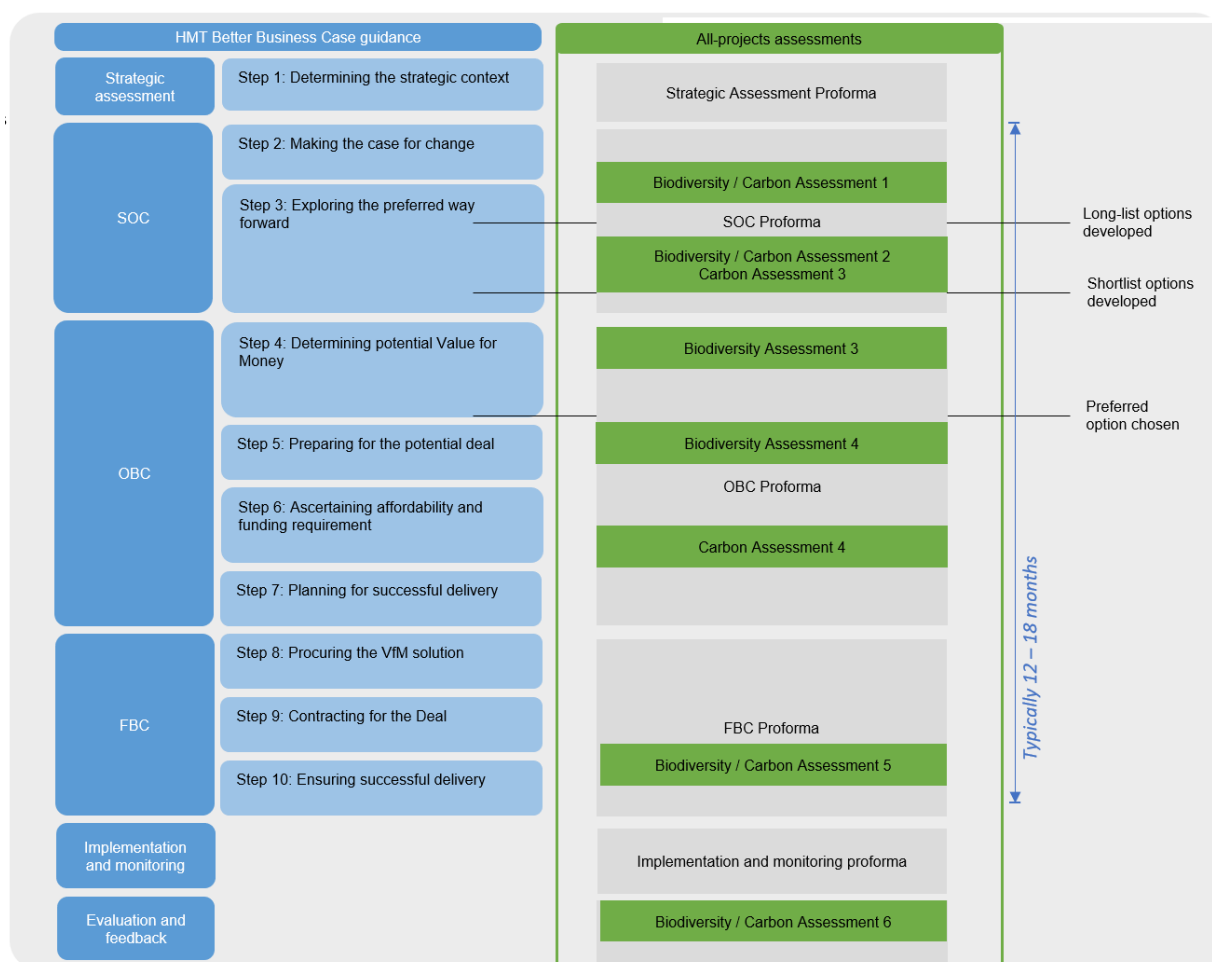
3. What does this guidance do?

The methodology is designed to guide Growth Deal projects in North Wales to improve biodiversity and reduce operational and embodied carbon impacts from the outset of a project, through the development of the business case, and into the running of the project.

The methodology sets out step by step requirements on how carbon and biodiversity should be considered as the business case develops and requires technical assessments at particular stages of the process to enable evidence-based design, impact mitigation and decision making. The methodology works alongside the Green Book and Better Business Case approaches committed to in the Growth Deal Governing Agreement 2 (GA2), and is structured according to HM Treasury business case development stages:

1. Strategic Assessment
2. Strategic Outline Case (SOC)
3. Outline Business Case (OBC)
4. Full Business Case (FBC)

As projects pass through these three stages, project teams can use simple decision trees to show which assessments they need at which stage.

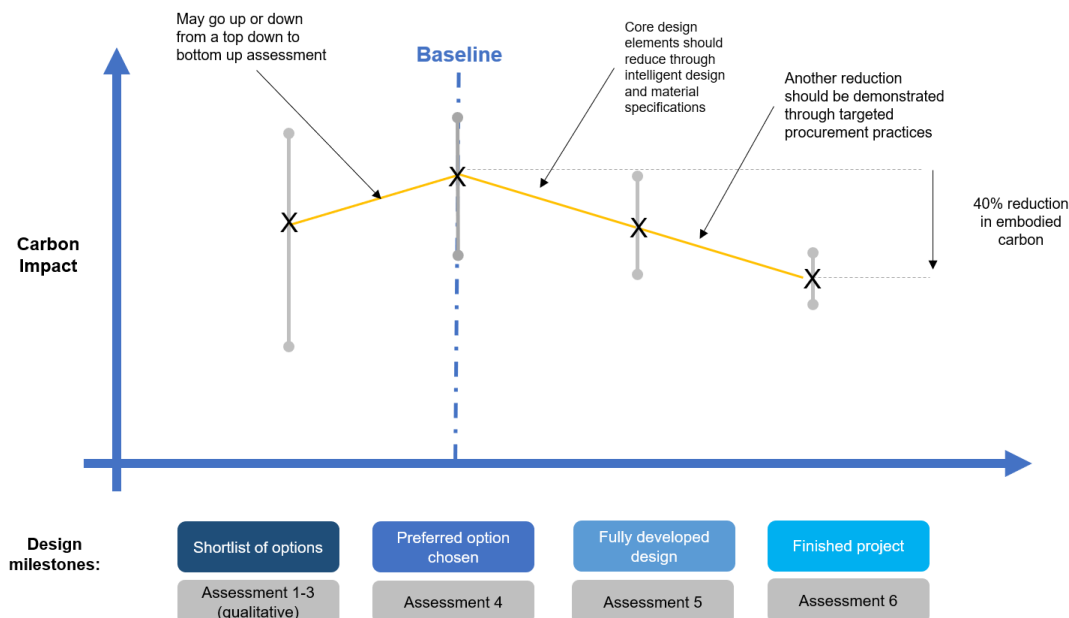


Typical timing for carbon and biodiversity assessments (source: Arup / ANW)

To help project teams make the assessments as they progress through the business case stages, the methodology includes a series of straightforward template forms – proformas – in an appendix. We provide proforma templates for each of the three types of assessment, each supported by guidance within the main body of the methodology:

1. **Business case assessments:** teams can use one-page business case proformas to show how they've considered carbon and biodiversity impacts and benefits in their strategic, economic, commercial, financial, and management cases. The questions are like checklists to guide project managers where to consider emissions and biodiversity within the project business cases.
2. **Carbon assessments (CA):** all infrastructure projects generate carbon emissions. These assessments help teams plan how to minimise them. The proforma templates take them from early stages (long-and-short-list stages), through to creating a baseline assessment, and then minimising emissions during procurement, design and implementation.
3. **Biodiversity assessments (BA):** If a project has biodiversity impacts, these assessments help teams plan how they'll mitigate them. The proforma templates start at the early stages (long-and-short-list stages), through making a biodiversity metric calculation and then minimising biodiversity impacts during procurement, design and implementation.

We've developed answers to the most common questions about the methodology in an FAQ document available with the full methodology.



How the methodology supports delivery against net zero carbon policies (source: Arup/ANW)

Relationship with other guidance

We've designed the guidance to complement the PAS 2080 guidance on Carbon Management in Buildings and Infrastructure,² and both sets of guidance quantify greenhouse gas emissions in a similar way. We expect this to become the UK's industry standard approach to managing carbon as PAS 2080 is widened to apply to the entire built environment, not just infrastructure.³

Filling out the carbon and biodiversity assessments as part of the business case will also help projects meet the natural capital requirements in the [HMT Green Book and supplementary guidance](#).

While the HMT Green Book approach captures emission and biodiversity (natural capital) considerations in a project's economic appraisal, it doesn't set targets. This methodology supports projects to deliver on the targets set by the Economic Ambition Board – and tracks them through to the final stages of each project. This will help regional infrastructure projects deliver on the net zero policy requirement (and related biodiversity considerations) of both Welsh and UK Governments.

4. What are the benefits of using this approach?

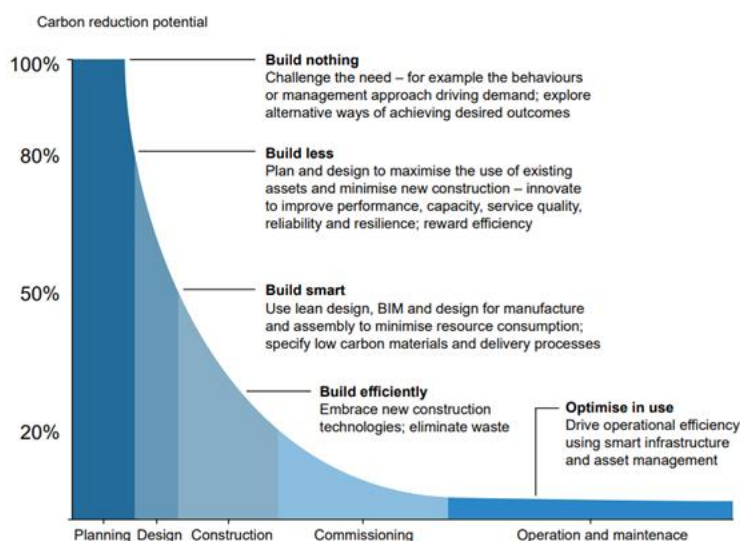
Following this methodology will bring significant benefits to Growth Deal projects and the region, including:

- **Less costs:** We will use materials which are better for the environment and will consider energy use throughout the planning of projects. By doing this, we will spend less on energy and will reduce the potential replacement cost of buildings and equipment due to factors such as change in regulations.
- **Improved biodiversity:** Our projects will actively address the loss of plants, insects and wildlife in North Wales.
- **Improved air quality:** Our projects will be energy efficient, which means less harmful pollution and less carbon released.
- **Increased opportunity:** In doing this, we will attract green investment, create green jobs and drive provision of more training opportunities in low-carbon approaches to construction and production.

As shown in the diagram below, the big benefit comes from cutting carbon at the very start of a project by making better choices.

²BSI, 2016. PAS 2080 Carbon Management in Buildings and Infrastructure.

³ Scottish City Region and Growth Deals: carbon management guidance for projects and programmes – gov.scot (www.gov.scot)



Source: Construction Leadership Council (via UK Carbon Infrastructure Review 2013)

This approach also tackles risks facing the Growth Deal.

If Growth Deal projects happen without emissions and biodiversity assessments, they risk making it harder for individual councils (and the national government) to deliver on their 2050 net zero and biodiversity commitments. They will create emission sources and biodiversity impacts that will be expensive to mitigate later.

The Growth Deal could also be exposed to:

- **Reputational risk:** if people don't see that the Growth Deal is preparing North Wales for a low carbon future and tackling biodiversity loss, there may be a public backlash.
- **Legacy risk:** if our projects' infrastructure is unfit for our low-carbon future then we'll feel the consequences for the 50-100 years of its lifetime.
- **Potential future funding risk:** both governments are demanding more stringent climate change and biodiversity mitigation, and future funding for Growth Deal projects may depend on meeting these stricter standards.

There's also a risk to us in North Wales of missing the opportunity to develop low carbon expertise. Other regions are racing to integrate low carbon technologies across regional supply chains. They're adopting low carbon construction methods and finding new ways of reducing energy use and emissions. If we don't adapt quickly enough, we could see existing inequalities with other UK regions grow, and limit long-term employment prospects for our workers.

While there's a risk that the guidance could make project costs more expensive, projects that have been testing it are reporting the opposite. They've found it helped them find innovative and lower-carbon ways of dealing with rising costs from supply chain issues. The technology is already here to meet these targets and our Early Market Engagement event has shown the construction market is ready.

5. Who is this guidance for?

The intended audience for the methodology is Growth Deal project managers who are aware of the importance of biodiversity, operational and embodied carbon and who want to apply a quantitative methodology with signposting to best practice tools.

Project Managers from other settings such as local authorities may also find the methodology useful in delivering projects that align to institutional biodiversity and carbon targets.

6. What does the guidance mean for projects?

All projects will need to complete a short proforma at each Business Case stage (Strategic Assessment, SOC, OBC, FBC). If the project will impact emissions, biodiversity or both it would need to complete:

- A series of emissions proformas
- A series of biodiversity proformas.

These are qualitative at first, prompting Red-Amber-Green (RAG) assessments, and then become qualitative as project design firms up. If costs can be assessed then carbon can be assessed similarly. Even if projects are later in the process, they should still complete the early-stage assessments as the Better Business Case guidance suggests revisiting earlier stages and checking earlier assumptions. Projects can still make savings even at a later stage.

As they complete these projections, project teams will need to think about how to mitigate their impact.

Carbon mitigation starts at the early stages (Carbon Assessment 1-2). Early design decisions like orientating a building to maximise natural light can have a substantial effect. Later on (in stages Carbon Assessment 3-4) it might mean thinking about construction materials – like swapping wood for steel. Or how to include renewable energy sources like heat pumps and solar panels. The earlier a project team commits to this low-carbon approach, though, the more opportunities to reduce emissions and reduce costs early on.

If a project will have biodiversity impacts then the team will follow a similar process. Again, the methodology works more effectively the earlier a project team starts using it.

Because of the wide range of projects in the Growth Deal the process will be different for each project. Each project team can integrate what they find into their design and build procurement, using either their own in-house technical expertise or external consultants.

Different stages need different technical skills and project teams can add their assessments into economic appraisals and planning considerations if they need.

7. Full methodology & supporting information

To access the full methodology and supporting information please email info@ambitionnorth.wales.

Acknowledgements

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Our Partners:



Governments:



European Social Fund:

