



Financing low-carbon infrastructure

A practical guide for civil engineers

ICE Working Paper

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Summary

ICE is proposing to publish a report on financing low-carbon infrastructure. The goal is to provide a knowledge base of green financing models for civil engineers who are involved in early project planning and in advising project sponsors.

The report is intended to give clear guidance and practical tools to help civil engineers understand and influence the emerging green investment market. It also aims to encourage those not yet involved in developing and financing low-carbon infrastructure to do so.

On a wider level, the aim is for ICE to help action the investment commitments made at last year's UN Climate Change Conference (COP26) and to prepare for COP27's theme of 'climate resilience and finance' at both a UK and international level.

ABOUT THIS WORKING PAPER

This Working Paper is based on initial desk research, a literature review and interviews with industry stakeholders.

We have talked to senior ICE members as well as investors, economists and entrepreneurs to gather opinion and insights – their thoughts have informed the content of this paper. It details the background, context and key objectives of the proposed final report and explores further research needs and how the project is expected to develop. The purpose of the Working Paper is to invite contributions from members to the final report – please get in touch at knowledge@ice.org.uk

The project team is led by Andy Milner, executive chairman of utility infrastructure installation specialist Matrix Networks Group.

US\$130tn

The amount of private-sector assets that the UN Glasgow Financial Alliance for Net Zero has pledged to utilise to transition economies worldwide towards net zero

The report is intended to provide clear guidance and practical tools to help civil engineers understand and influence the emerging green investment market

Introduction

In October 2021, on the eve of the UK's hosting of COP26, Chancellor of the Exchequer Rishi Sunak called for "a green industrial revolution".

Civil engineers were critical to the first Industrial Revolution, driving societal change and prosperity. What role should the profession play in the next revolution – one that is focused on delivering low-carbon infrastructure and equitable economic growth? Where should civil engineers focus their efforts? How can they influence decision-making and how involved should they be in driving investment towards low-carbon infrastructure? Is there knowledge that engineers can impart to the finance community to help accelerate the transition to a lower-carbon economy?

In turn, what do civil engineers need to know about the rapidly growing green finance sector? What are the gaps in knowledge and understanding that we need to fill? Are there blind spots holding the profession back from change – from being an active agent in the green industrial revolution?

Context

In the private sector, environmental, social and governance (ESG) agendas are becoming more ambitious, while corporate disclosure rules on carbon emissions and ESG issues are becoming more and more demanding. As a result, money is flowing towards projects that can be shown to be lowering carbon emissions and mitigating climate change – the share of sustainably invested assets among investors worldwide was 18% in 2020, a figure that is set to more than double to 37% by 2025 (source: JP Morgan).

At a societal level, COP26 was an inflection point in the conversation about climate change and the need to drastically reduce global carbon emissions. The discussion has been ongoing for decades but the event marked a shift in public perception and media coverage.

A number of significant new commitments from industry and the finance sector were made at COP26. The [UN Glasgow Financial Alliance for Net Zero](#), for example, pledged to utilise US\$130 trillion of private-sector assets to transition economies worldwide towards net zero.

The challenge now is to take these commitments and put them into action. In the UK, the Government has made clear that the first step to delivering a green industrial revolution is "ensuring that the information exists to enable every financial decision to factor in climate change and the environment".

Civil engineers are rarely involved at the financing stage of a project, something that ICE believes should change because they are there at the planning, design, construction and post-completion stages. They hold a wealth of knowledge and are integral to the success of infrastructure projects. If the success of such projects in 2022 and beyond is defined by how low-impact a high-rise office building, a new power plant, a small bridge in a town centre or a road refurbishment is on the environment, how can the profession ensure that it contributes to this?

The finance community is answering the call for the transition to a low-carbon economy. But what questions will investors have about potential low-carbon infrastructure investments before they feel confident enough to commit their capital? Civil engineers can help to answer these questions.

Understanding and making the investment case for low-carbon infrastructure will be essential. Failing to advocate for change will mean that the 2050 net-zero target will be missed and the chance to create meaningful reduction in climate change will be lost.

What ICE aims to accomplish

This Working Paper sets out ICE's plans for a wider report that aims to equip civil engineers with the knowledge they need to engage in informed discussion about financing low-carbon infrastructure projects. It also asks questions of our industry. What can we do to ensure we are not just keeping up with the times but actively influencing the direction of travel?

18%

The share of sustainably invested assets among investors worldwide in 2020 – a figure that is set to more than double to 37% by 2025

Achieving meaningful carbon reduction, consistently delivering high-quality, low-carbon infrastructure and making these projects the first choice for investors will not happen in silos. The purpose of the proposed report is to offer guidance on the opportunities and challenges of financing low-carbon projects and to make the case for civil engineers to play an active role in ramping up investment.

It is envisaged that the report will:

- Provide members and key stakeholders with a practical and user-friendly guide to green investment tools and methods, backed by examples and case studies, that will promote a fluency in talking about financing for low-carbon infrastructure projects
- Outline what civil engineers can bring to the table during the transition to net zero, with low-carbon infrastructure being the rule rather than the exception.

It could mean working closely with other parts of the infrastructure ecosystem to develop a more holistic approach to carbon reduction. Adaptation finance is a key area in which civil engineers could provide investors with guidance and information. It means advocating at international, national, regional and micro levels when delivering projects to ensure that they are designed with carbon reduction as a baked-in principle from the outset. Developing and providing accurate data on the carbon profile and impact of projects, to help de-risk future investments, is also an integral part of the process.

For non-ICE members reading the report – a government official, perhaps, or an investor or project developer – the intention is to give them access to information about both civil engineering and green finance that will help to drive a systemic approach to boosting low-carbon infrastructure development.

Making the investment case for low-carbon infrastructure will be essential – failing to advocate for change will mean that the 2050 net-zero target will be missed and the chance to create meaningful reduction in climate change will be lost

Defining terms

The words ‘green’ and ‘sustainable’ are vague and can be hard to define. It’s important that we are clear about what we mean when we discuss green and low-carbon financing in this paper. Some external definitions include:

“At its simplest, *green finance* is any structured financial activity – a product or service – that has been created to ensure a better environmental outcome. It includes an array of loans, debt mechanisms and investments that are used to encourage the development of green projects, or minimise the impact on the climate of more ‘regular’ projects. Or a combination of both” – [World Economic Forum](#)

“*Sustainable finance* refers to the process of taking environmental, social and governance considerations into account when making investment decisions in the financial sector, leading to more long-term investments in sustainable economic activities and projects” – [European Commission](#)

“*Greening finance*: ensuring current and future financial risks and opportunities from climate and environmental factors are integrated into mainstream financial decision-making, and that markets for green financial products are robust in nature” – [UK Government](#)

When discussing infrastructure investment opportunities, we have been using the terms ‘low carbon’, ‘lower carbon’ and ‘net-zero carbon’. No project can be ‘carbon-free’ or ‘zero carbon’. Projects can and should, however, strive to be as low in carbon as is technically and economically possible.

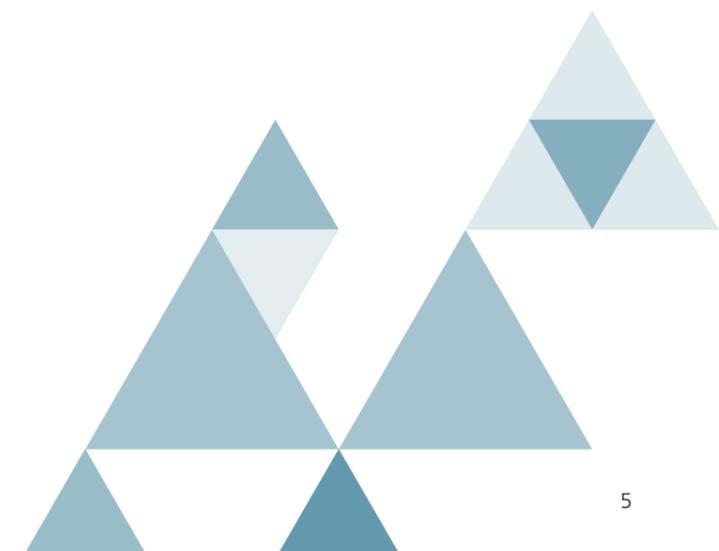
ICE believes that it is crucial to be honest, accurate and realistic about what these terms mean, what is achievable and what stage the industry is at in 2022. Greenwashing – the practice of making a practice, project, business or investment appear more environmentally sound than it is – is a risk, and one that undermines progress and public trust in efforts to decarbonise infrastructure. Superficial commitments will not cut it.

In an effort to deepen knowledge and the wider conversation about low-carbon infrastructure, the proposed report will review:

- The definition, parameters and expectations of green finance and low-carbon infrastructure in the coming years
- Current, emerging and as-yet untested financing models



It is crucial to be honest, accurate and realistic about what terms such as ‘low-carbon financing’ mean, what is achievable and what stage the industry is at in 2022



Scope and outreach

Existing and emerging financing models

A primary goal of this project is to equip ICE members with a working knowledge of the most important and utilised methods of financing low-carbon infrastructure currently in use and to highlight emerging mechanisms and schemes.

We will outline the following financing models, interviewing key players and providing case studies for each of them:

Project financing – traditional debt and equity-backed projects that have been funded under sustainable models

Government subsidies

- State auctions – such as the UK's Contracts for Difference
- Government bonds such as the [UK's Green Gilt](#), which has raised £16bn to date, and NS&I Green Bonds. These will fund clean transportation, energy efficiency, renewable energy, pollution prevention and control, living and natural resources, and climate change adaptation.

Pension fund/investment – for example, in late 2021 Nordic and UK pension funds collectively committed US\$130bn to [climate change-related investments](#) by 2030. In January this year, asset manager Abrdn (formerly Standard Life) and private logistics fund manager Tritax announced the co-financing of a £3.8bn [EV battery factory in Northumberland](#).

Private equity – green funds

Crowdfunding – for emerging technologies, this is a viable option that has been used successfully in the UK and internationally.

Green finance is evolving all the time as new projects and entrants to the market emerge. Besides the most popular financing models, we intend to look at innovative financing options that are perhaps only in an early stage of uptake.

Case studies and examples

The primary focus will be on financing models and examples used in the UK, but we also plan to look further afield for knowledge and inspiration – ICE's membership is international and the transition to a lower-carbon economy is a global challenge.

It is particularly important to look worldwide because developing nations are the most vulnerable to the economic, social and political impacts of climate change. The shift to low-carbon infrastructure needs to be global and systemic if it is to be effective at mitigating climate change.

At COP26, Scotland was the first country to commit funding to loss and damages created by [climate change in developing nations](#). Civil engineers prevent, mitigate and repair such damage. As climate change continues, this role will become even more important. Emerging fields of green finance, such as [adaptation finance](#), may be particularly suited to civil engineers advising on the challenges and opportunities involved and being in direct contact with sources of funding.

We also plan to explore innovation internationally. For example, South Africa has a successful Renewable Independent Power Producer Programme and its Treasury recently published a [framework document on sustainable finance](#).

In the course of research for this Working Paper, some interviewees highlighted the importance of focusing not only on one-off, multibillion-pound national and international projects but also on ensuring that an increase in low-carbon investment consistently takes place at local and regional levels.

Sectors

The most obvious home for green financing is the energy industry. This is where the bulk of investment has been directed to date, and is one of the UK's biggest carbon reduction success stories. The UK offshore wind programme, for example, is providing a template for other countries and sectors to mobilise private finance into low-carbon infrastructure. It is likely that many of the case studies and examples we cite will be from the energy sector.

Still, carbon reduction needs to become a core principle in every infrastructure sector. We want to highlight investments in other areas – for example, transport, water and coastal schemes that are working to reduce their carbon footprint or mitigate climate change.

We will also look at how different engineering disciplines and activities can best be deployed in the transition to low-carbon economies underpinned by green infrastructure.

For example, construction management can have a major impact on the carbon footprint and impact of a project. Geotechnical engineers will be vital to translating established ways of designing and constructing foundations into methods that work for newer technology – there are currently calls for these engineers to translate design codes for offshore oil and gas structure foundations into viable codes for [offshore wind turbine foundations](#).

Further research and next steps

To provide clear guidance backed by examples and case studies, we will continue to talk to ICE members, industry stakeholders and the wider green finance community to understand the crucial issues that the report should address.

In particular, we are keen to interview representatives from the ICE regions; the international community; the UK Infrastructure Bank; the Environment Agency; the International Coalition of Sustainable Infrastructure; the Global Infrastructure Hub; private investors, including private funds and pension funds with dedicated green financing allocations; development banks; and stakeholders from the transport, water and energy sectors. Questions we want to ask include:

- Civil engineers currently have a limited commercial input in this area – there is a separation between the technical and investment communities. Do they need to know about green financing? If so, why? If not, why not?
- How can engineers de-risk the low-carbon infrastructure sector for investors, making it a more attractive and viable proposition?
- What are the factors behind one low-carbon infrastructure project failing to attract investors and another succeeding? Can civil engineering expertise help to get more projects over the line?
- What specific areas of low-carbon infrastructure development should ICE members take the lead on? Are there particular pain points when it comes to developing projects and matching them with finance which the industry can help to address?
- Are there decarbonisation commitments that the UK and international civil engineering communities could make that could have a major knock-on impact on related disciplines?

The responses and examples will guide the development of the ensuing report.

We are also seeking knowledge and global case studies from ICE members and key stakeholders. We are planning to hold expert interviews in June and July to gather expertise, and to publish an interim report in the summer.

It is intended that the complete report will be published in time for COP27, which will take place in Sharm el-Sheikh, Egypt, in November 2022. One of the core themes of the conference will be actioning and accelerating finance – this report aims to contribute to the discussion.

The report will be supported by digital and in-person events exploring the themes with experts, our interviewees and other stakeholders. We will also publish a series of blog posts and articles to support it. A review panel will be invited to judge the final report.

We welcome questions, comments and feedback on this Working Paper – contact us at knowledge@ice.org.uk



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ICE
One Great George Street
Westminster
London SW1P 3AA
UK

Get in touch
For more information, please contact:
ICE Knowledge
E: **knowledge@ice.org.uk**
W: **ice.org.uk**