

What is your Decarbonisation SCORE?

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The challenge today to create a better tomorrow

In the Paris Agreement in 2015, governments acknowledged that their national climate targets at the time would not meet the goal of limiting global warming to 1.5°C. 2020 was the target year to submit long-term strategies and for emissions to reach a peak.

COP26 reaffirmed commitments to global carbon reduction goals with individual countries now asked to adopt more ambitious and stringent targets in order to achieve a scenario of less than 1.5 °C global temperature rise, and to report on these targets by the end of 2022.

The recent UN Intergovernmental Panel on Climate Change (IPCC) report also stated that carbon reduction commitments made prior to COP26 were not enough to reduce the impacts of climate change to less than a 1.5°C average temperature rise, and would also make it harder post 2030 to limit overall average temperature increase to less than 2 °C (IPCC, 2022). However, the report also recognised that the costs of several low emissions technologies which have seen significant investment over the last decade including solar, wind and battery technology have fallen and continue to fall.



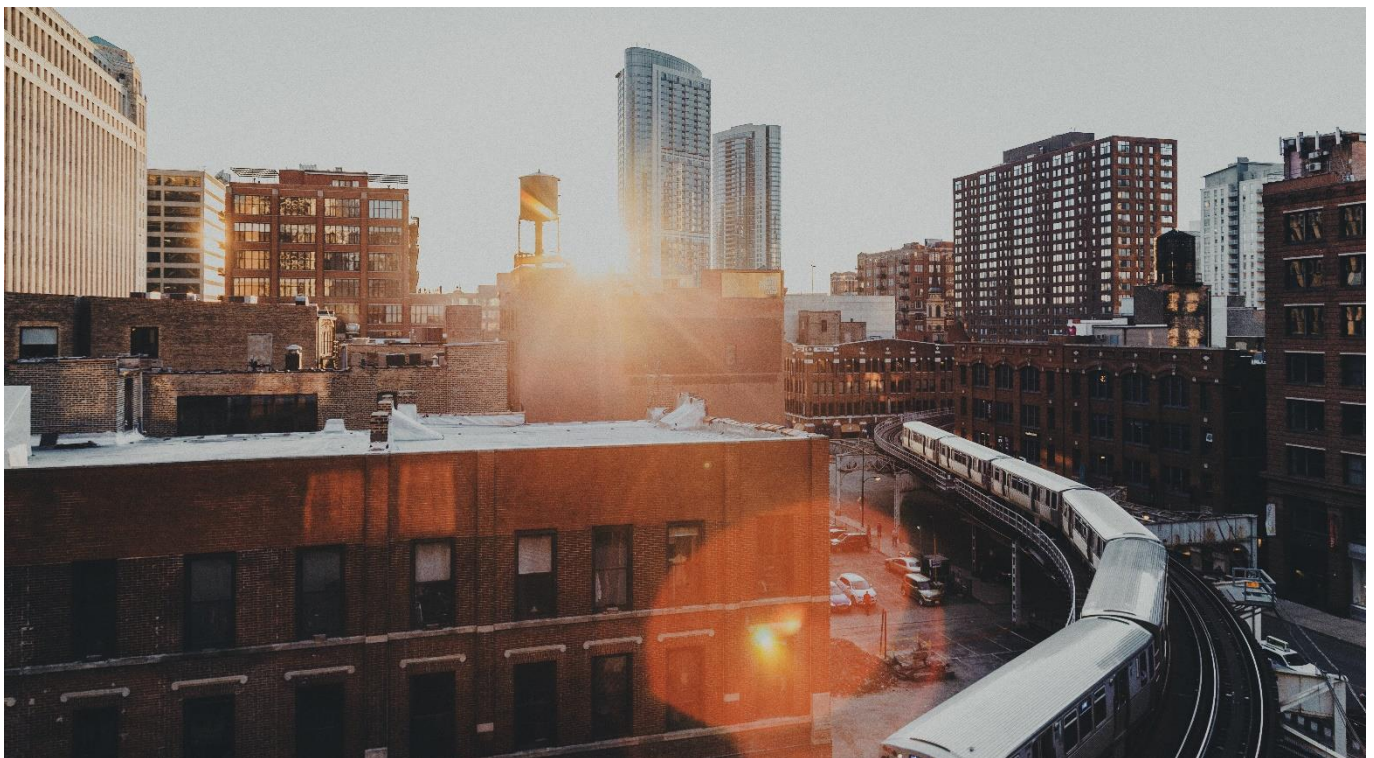
Drivers to decarbonise

The scientific efforts to quantify the scale of the challenge has helped us to better understand the need for decarbonisation, whilst the urgency for action is now sharply in minds of policy makers, shapers and governments. This has led to pressure on organisations to build from multiple angles to create a more sustainable economic, environmental and social pathway.

We are a world in transition. The momentum behind energy transition is accelerating. Many nations are setting out their ambitions, targets and policies, and over 100 countries committed to cut CO₂ to net-zero by 2050 (representing 70% of the world economy) (UN, 2020). Organisations and governments are responding to the need to change as well as pressure from global governments, investors, clients and end-users'. Consensus at COP 26 was that the progress made since 2015 has not been enough and an unprecedented effort is required by countries to cut the level of emissions and get back on track. However, emissions are increasingly impacting the balance sheet with the growing development of carbon pricing, whether through emissions trading systems or carbon taxes.

Energy, heat production and industrial processes account for more than half of all global greenhouse gas emissions. The pathway to reduce the carbon emissions of extractive and process industries will need to leverage a breadth of solutions, but the applicable solution set will also differ depending on geographies, enterprise portfolios and the characteristics of individual assets. Innovative solutions need to be secure, scalable, and reliable leaning on product and industry expertise to deliver a better world for the future.

Although these are drivers mostly effecting your bottom line, it's imperative to mention that these are not the only reasons why immediate action is recommended, but also the real threats climate change has on our world, cities, houses, families and even our own lives. What's at stake cannot be understated. Climate change has the potential to bring about spiked prices in our food, a global rise in catastrophic storms causing devastation to daily life. This problem is much bigger than business, it is also personal.



How to navigate your decarbonisation journey

The journey to decarbonisation is complex and knowing where to start can be difficult. It is important to apply a structured process to be able to map out how your goals will be achieved and ultimately realise them.

To simplify this complex process, our experts created the Decarbonisation SCORE methodology which provides a roadmap to setting and delivering emissions reduction targets. By using this methodology, our team can assess where clients are in their journey and then devise an actionable and implementable plan complete with progress reporting on how to make your objectives achievable.

Wood's structured and dynamic process, as seen in Figure 1, brings together the breadth of our technical advisory, specialist domain knowledge, project and operations expertise, with a deep understanding of innovative technology solutions, as well wide sector and global experience as a trusted thinking and delivery partner. Our team are also able to design your solution, help you implement the necessary changes, and monitor performance with real-time insight.

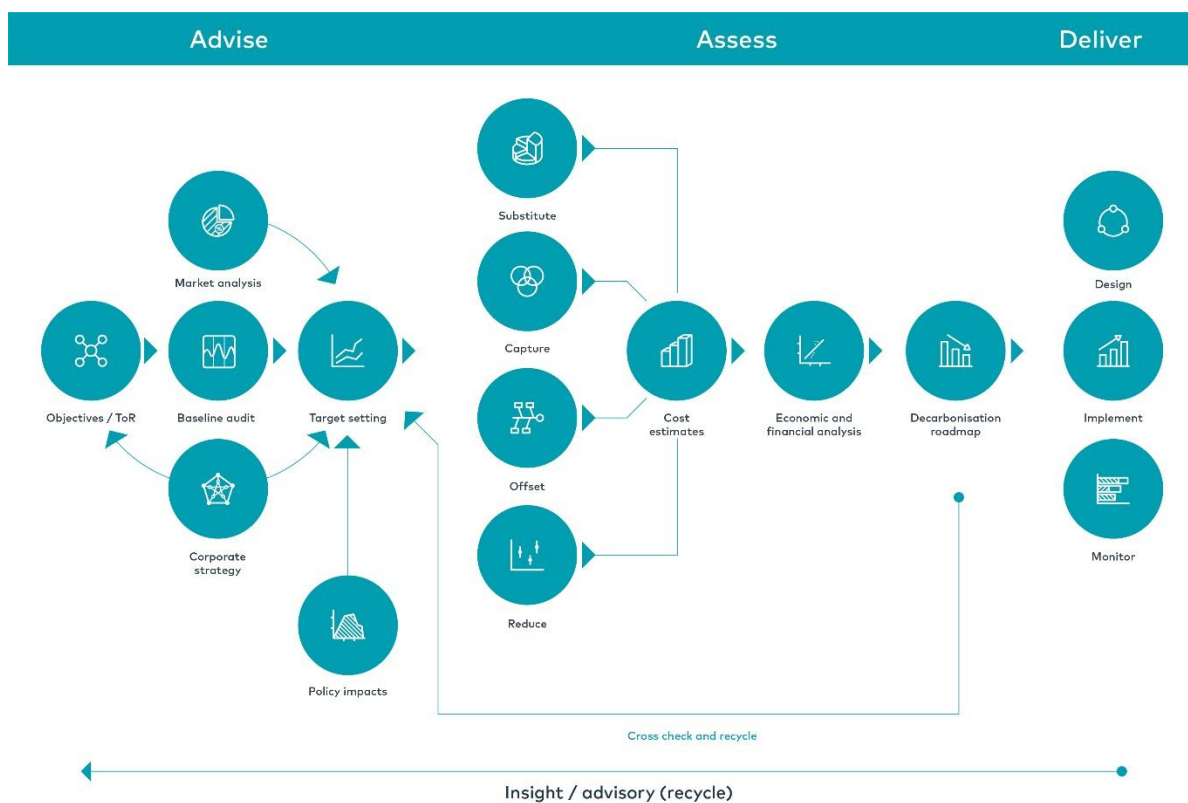


Figure 1: Wood's Decarbonisation SCORE methodology

Where should you start?

Advise - get started, baseline your program and set targets

Knowing where to start can often be the biggest challenge. Understanding your drivers, changing policy and subsidy landscapes, and baselining your current emissions are keys to success.

A strong foundation to any carbon reduction programme will consider the carbon life cycle of the feedstocks consumed, products produced and quantification of individual emissions sources to identify and maximise the opportunities to reduce carbon emissions at the most efficient cost.

Working across a variety of sectors from upstream oil and gas through to refining, petrochemicals and life sciences enables Wood's experienced engineers within each sector to apply their knowledge to both carbon footprinting and life cycle analysis, as well as forming a sound basis for identification of carbon abatement opportunities.

Understanding your carbon footprint, corporate objectives and the how the markets you operate in may evolve, is key to setting achievable carbon reduction goals. This could be against a series of interim milestones and time horizons as you approach the overall goal of meeting a net-zero objective.

What do you need?

Assess - informed decision-making, to pick the right projects

When considering the technologies, projects or asset modifications that can be adopted to achieve decarbonisation goals the range of opportunities can be bewildering. From automation or advanced process control technologies to help improve operational performance and reduce energy consumption, through to large scale capital projects in carbon capture or hydrogen production, how do you decide which opportunities are the right ones for your business or asset?

The Decarbonisation SCORE methodology can be applied to single or multiple assets, to a client's full asset portfolio or across a specific geography or region using an evaluation assessment of opportunities to:

Substitute - substitution of fuel or feedstocks (raw material to supply or fuel a machine or industrial process) consumed for renewable or less intensive sources.

Substitution can include solutions such as, switching electricity provision to a renewable source or considering the use of renewable and bio feedbacks in the production of fuels and chemical products. In some sectors, for example aviation fuels, bio-alternatives represent the biggest opportunity to meet carbon reduction goals, while next generation technologies (e.g., hydrogen fuelled aircraft) are being developed as potential longer-term solutions.

Capture - employing carbon capture technologies, or emissions control technologies, to substantially reduce or eliminate harmful emissions to the atmosphere.

There is a wide range of carbon capture technologies available, from traditional post-combustion absorption, through to pre-combustion or oxy-fuelled technologies. Many technology providers are starting to commercialise proprietary amine solutions, or novel technology concepts, to help drive down the cost of implementing carbon capture projects. In any technology evaluation, it is important to consider technology evolution as well as the full CO₂ value chain from capture, through transportation to ultimate end use or sequestration options.

Offset - considering assets or product portfolios across a country or company-wide scale to achieve decarbonisation/clean air goals, alongside potential for offsetting investments or potentially carbon credit trading.

Offsetting is a topic discussed frequently within industry and environmental groups, and it is very important to consider that any actions taken in this regard cannot be identified as 'greenwashing'. Offsetting is an opportunity that should be addressed as a solution for residual carbon emissions once technically and commercially feasible solutions have been implemented. Often assumed to be related only to carbon credit trading, offsetting can take many forms. This can include investment in natural climate solutions (for example afforestation) or technologies like Direct Air Capture (DAC) in addition to the potential for carbon credit purchases or trading.

Reduce - looking at holistic asset optimisation considering areas around energy efficiency, digitalisation and operations and maintenance best practice.

Often the best place to start a decarbonisation journey is to consider opportunities to improve the performance of your existing assets. A review of energy optimisation opportunities across an asset can identify additional benefits, such as yield improvement, which can not only reduce operating costs, but also have a positive impact on margins. Solutions for reducing energy consumption and therefore CO₂ emissions can vary from identifying best practise operational practises, deploying the latest control or automation technologies, and low-cost projects to make the most of heat integration opportunities (and many other potential solutions).

Evaluate - whatever your decarbonisation journey, it's important to apply a structured evaluation process to be able to map and meet goals, and lead to a successful outcome.

Typical techno-economic metrics such as Return On Investment (ROI) or Net Present Value (NPV), do not justify the implementation of many carbon reduction projects. We can consider what the carbon price would need to be to underpin each opportunity on the basis of an economic return (Internal rate of return (IRR) or Net Present Value (NPV). While government funding and incentives are available in many countries to underpin investment in alternative fuels, the same is not necessarily the case when it comes to projects purely aimed at reducing carbon emissions from existing industry. Wherever your assets are located it is imperative to understand the incentives and funding mechanisms that you can take advantage of to achieve your decarbonisation goals.

However, it is equally important to consider other drivers within the evaluation of your carbon reduction opportunities. For example, the impact against your overall company ESG goals, the drive from your shareholders to decarbonise, or the effect that realising your carbon reduction goals will have on company reputation and ultimately shareholder value.

All these levers can be built into an overall evaluation methodology specific for your organisation or asset, reflecting your specific drivers and goals of the overall decarbonisation masterplan. Enabling you to identify the optimum project, or section of projects to achieve the carbon reduction targets put in place.



How will you succeed?

Deliver: end-to-end execution realising emission goals

The SCORE roadmap allows each asset to develop its own robust decarbonisation plan. Providing implementable solutions with the ability to be delivered into operation according to each asset's development timeline.

Decarbonisation SCORE in action

Wood's [Decarbonisation SCORE methodology](#) was created in-house in 2020 and now being used globally by our clients, and even on our own company. For example, one of our industrial process clients aimed to develop a decarbonisation masterplan for a cluster of energy-intensive industries. By leveraging a range of technology solutions such as carbon capture, renewable power integration and clean hydrogen production, Wood developed the concept selection and early design for the project.

This project aims to abate more than 8 million tonnes per year of CO₂ emissions and ultimately create a zero-carbon industrial cluster. Integrating established combined heat and power production and refining industrial sites using state-of-the-art technology to create a platform for industrial growth and economic development while meeting decarbonisation targets.

This is one of several industrial clusters that we have seen developing across the globe. The aims of which are to leverage shared infrastructure costs, access government funding and incentives in order to deliver carbon reduction commitments in the most cost-effective manner.



Making the journey more efficient

Accelerate sustainability through data-driven insights and smart tools

While ambitious emissions targets are announced, capacity to collect auditable data is immature, and your key decisions must be based on accurate and verifiable data.

Wood offers a range of operations services, from asset performance technology solutions through to duty-holdership, giving our clients an overview on asset performance against decarbonisation targets. This includes our [ENVision real-time carbon footprinting software](#), shown in Figure 2, which provides visibility of carbon and other emissions to ensure reduction targets are achieved. ENVision manages carbon and emissions data, performs regulatory calculations and reporting, allowing KPI management, an auditable record of data and optimisation.



Wood ENVision



Figure 2: Screen shot of ENVision

By accessing quality, high frequency data, in combination with external data sources, ENVision allows organisations to set strategic, realistic goals, define their roadmap and track progress. With a Microsoft Azure backbone, this tool collates emissions data across a portfolio of assets, to track a organisations real-time footprint and performance metrics. The open structure also allows the addition of scope 1, 2 and 3 emissions.

Our team effectively deployed ENVision across a chemical complex that included 26 large chemical units in Saudi Arabia, with real-time emissions data collation, verification and reporting. Utilising the ENVision tool over 1.3million individual data points are updated every 30 seconds to operators in order to provide the necessary information to help drive efficiency and reduce emissions. The client indicated an improvement of 10 times faster reporting methods and better vision of plant operations that resulted in a reduction in effort associated with emissions reporting by around 80% and a reduction of excess emission time by 40% through early identification.

It is also becoming more critical to understand not just the carbon footprint of our assets, but also the carbon footprint of the activities associated with building, maintaining and modifying them. To that end, Wood, and its project services subsidiary company [rhi](#), developed the [Carbon Column toolkit](#) to allow us to assess the carbon emissions associated from material sourcing, transportation, and construction activities (among other scope 3 emissions) to enable ourselves and our clients to make informed decisions and minimise the carbon footprint of project delivery.

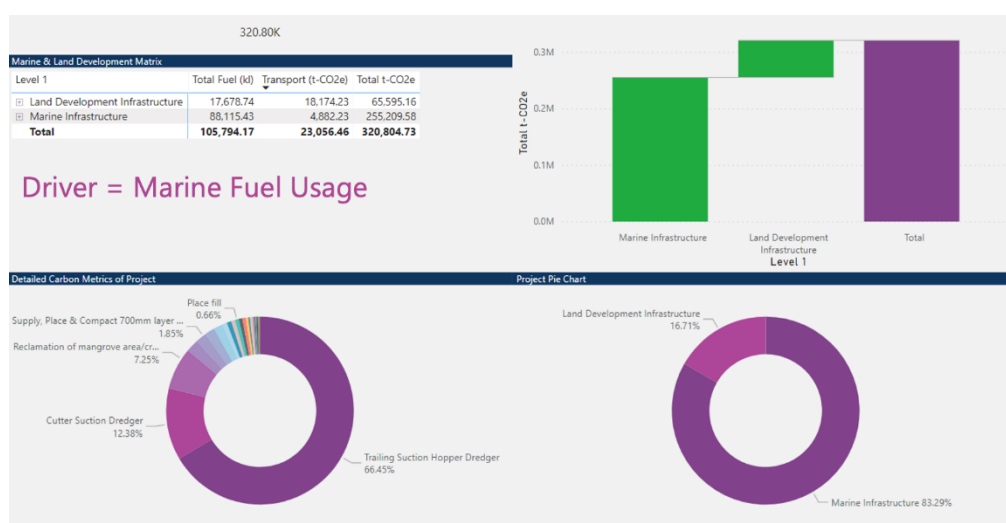


Figure 3: Screenshot of the Carbon Column toolkit

Carbon Column provides a focussed approach that provides technical insights and solutions recognising the Taskforce for Climate-related Financial Disclosures (TCFD), GHG Protocol and ISO standards. The delivery is through a Tiered Reporting Process with 4 internationally recognised tiers.

Tier 1 – Default factors based upon knowledge of project parameters such as fuels, materials, services and product types.

Tier 2 – Application of benchmark factors for equipment type, characterisation of fuels, and estimate of consumption. Materials, services and product types and estimates of quantities and transport type and distances.

Tier 3 – Application of defined factors for specific equipment and details of final fuel types and rates of consumption. Specific material quantities and regional or source factors and transport type and distances. Feedstocks and product quantities, mode of transport and distance to markets.

Tier 4 – Measurement – Fuel Quality & Quantity, Power Consumption, Leak Detection. The application of Wood's ENVision tool was used to measure, monitor and manage direct emissions throughout the operation.

The time to act is now

Global climate change is arguably the most important and urgent challenge humanity has ever faced, and the onus now falls upon companies to make the difference.

While 121 countries have committed to be carbon neutral by 2050, they only account for less than 25% of emissions. On present policies, the world is heading for a 3°C rise by 2050, triggering a global environmental and financial crisis. The commitments made during COP26, and to be unveiled at COP27 in Egypt, are an absolute necessity to limit the global and potentially catastrophic impacts of climate change.

At Wood, we believe that every organisation has a decisive role to play in achieving sustainability for the environment as well as their own business. All organisations urgently need to implement sustainability measures that are data-driven, enabled by innovative real-time digital technology, and that can make an immediate impact on decarbonisation and emissions monitoring. But no single company can do this on their own – who you partner with is key.

The time for talk is over, and the need for change is urgent.





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