Our fuel hierarchy

Helping us manage our impact on the environment

Balfour Beatty

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Foreword

At Balfour Beatty, we pride ourselves on being a responsible, sustainable business and, in our Building New Futures Sustainability Strategy, we have set out our ambition to go Beyond Net Zero Carbon by 2040. As we continue to decarbonise our operations, we're phasing out the use of diesel and other fossil fuels as quickly as possible.

However, as we do this, we must act responsibly and consider the full implications of our actions to make sure that we are not solving one environmental challenge and creating another. As set out in our position paper 'Hydrotreated Vegetable Oil (HVO) and Gas to Liquid (GTL)', these fuels have been widely marketed as a sustainable solution to fossil fuels. However, given supplies of HVO from sustainable sources are currently limited, there is a strong likelihood that a sharp increase in demand could drive an increase in palm oil derived HVO or palm oil being used as a livestock feed alternative, contributing to further global deforestation.

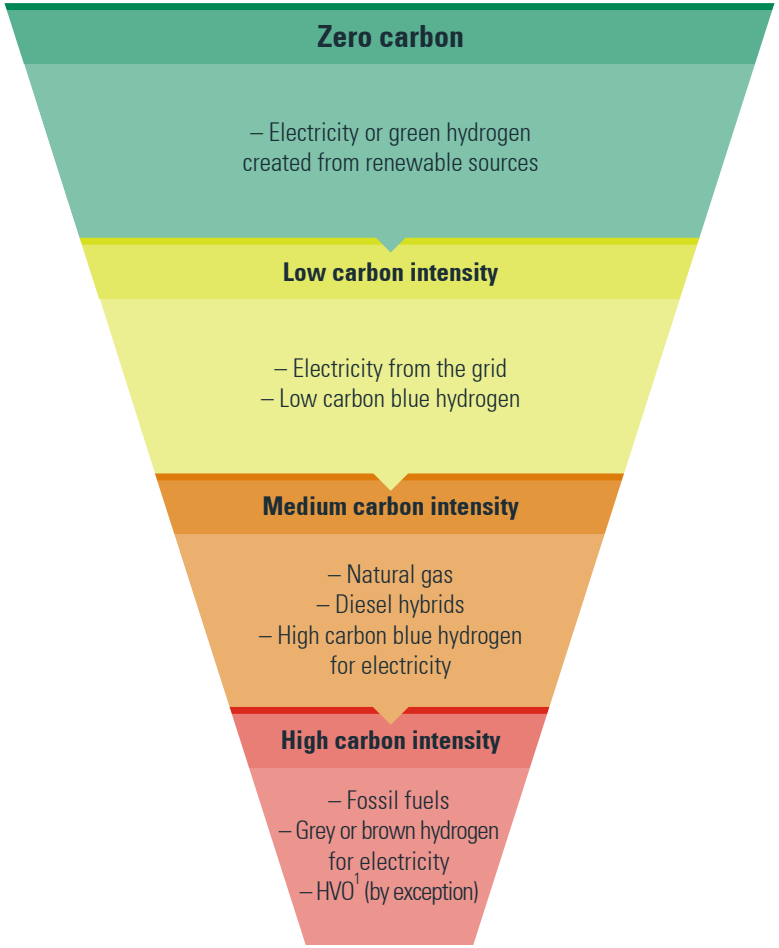
This uncertainty in the supply chain of HVOs means that we are not adopting HVO until such a point that these issues have been resolved beyond doubt.

Our discussions internally, with customers and with supply chain partners have prompted us to develop our fuel hierarchy, set out in the diagram opposite and in more detail in the following pages, to provide a guide to the carbon intensity of the energy sources currently available. Developed by our in-house energy management experts, it is the easy-to-understand tool that everyone at Balfour Beatty and our supply chain partners should use to help select the right energy sources for our plant, equipment, vehicles and buildings which account for the majority of our scope 1 and 2 emissions.

By using the hierarchy to guide our decision making, mandating the use of certain tools and technologies and trialling and adopting innovative solutions, our aim is to fast track a reduction in our carbon emissions and play our role in the fight against climate change.

Jo Gilroy
Sustainability Director
November 2022

Choosing the right fuel



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Hand operated tools and non-operated plant

Over recent years, the availability of battery powered tools has grown significantly. Recognising both the carbon and cost savings of using battery powered tools over tools powered by fossil fuels, we have invested in these tools as well as having a wider range of options available via our supply chain partners.

Whilst adopting battery powered tools removes the need for fossil fuels to directly power the tool, it is important that we have a low carbon electricity supply for charging batteries to ensure we are not simply transferring the emissions from one source to another. To ensure we have low carbon electricity, it is always our preference to connect to the electricity grid via our own renewable energy contracts and we actively work with our customers from the earliest stage possible to make this happen. In circumstances where we cannot connect to the grid via our own contracts, our preference is to use the customers' existing grid connections before exploring hydrogen or other energy sources.

As the availability of battery powered tools continues to grow and electricity supplies are decarbonised across the UK, we anticipate that the carbon intensity of our hand operated tools and non-operated plant will continue to be reduced. We will also benefit from reductions in air pollution and hand arm vibration syndrome (HAVS) risks as well as the tools we use every day having less maintenance requirements than traditional tools that have small combustion engines. This means that the transition to battery powered hand operated tools and non-operated plant will benefit those using the tools as well as reducing our carbon footprint.

Case study: Working towards a diesel free depot

Across our highways maintenance contract for Lincolnshire County Council, we've been trialling 30 battery powered breakers and three battery powered disc cutters. The batter powered tools reduce our carbon emissions by 9 tonnes per year and by removing the need for 4,100 litres of fuel each year.

Did you know?

If your project is powered by Balfour Beatty's renewable energy electricity contract, your hand operated tools and non-operated plant will produce zero carbon emissions from their energy source. To set up your electricity connection, please contact the Site Mobilisation Hub as early as possible.

Procuring the best solutions

Following the successful trial of battery powered hand operated tools and non-operated plant in our Highways and Living Places businesses, we now have battery powered alternatives for tasks including:

- Drilling
- Cutting
- Grinding
- Sanding
- Concreting
- Bolting
- Breaking
- Compaction
- Vegetation clearance and gardening

Please contact the Plant Hire desk on 01142 329 760 to find out more and order these tools.

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Hand operated tools and non-operated plant energy sources

	What's available[1]	Energy source	Fuel availability and how to access
Zero carbon	Battery operated tools, solar powered tower lights and battery powered rammers	Balfour Beatty contract renewable electricity	Our supplier only provides renewable electricity. Please contact the Site Mobilisation Hub to use.
		Solar	Solar tower lights and battery powered security cameras are available. Please contact the Site Mobilisation Hub for more details.
		Green hydrogen for electricity generation	Green hydrogen trials are underway, please contact the Energy team for more information.
Low intensity	Battery operated tools, solar powered tower lights and battery powered rammers	Low carbon blue hydrogen for electricity generation	Please contact the Energy team for more information and supplier options.
		Grid average electricity	Only used if there is already a non-Balfour Beatty electricity supply in place. Please speak to the Site Mobilisation Hub to explore if you can use Balfour Beatty contract electricity.
Medium intensity	Battery operated tools, battery powered rammers, remote mapping and compaction	High carbon blue hydrogen for electricity generation	Please contact the Energy team for more information and supplier options.
High intensity	Hand operated tools and small plant	Petrol	Please make local arrangements to purchase petrol from a reputable source.
	Battery operated tools, battery powered rammers, remote mapping and compaction	Grey and brown hydrogen for electricity generation	Please contact the Energy team for more information and supplier options.

Get in touch Site Mobilisation Hub - mobilisationhub@balfourbeatty.com | Energy Team - emumobilisation@balfourbeatty.com | Procurement team - procurement.mailbox@balfourbeatty.com | Fuel cards - fuelcard@bbfleetservices.com | Certas - CertasEnergy.NationalAccounts@certasenergy.co.uk

1 - All plant and equipment is available from the Plant Hire desk who you can contact on 01142 329 760.

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Plant 1.5 — 10 tonnes

To lower the emissions from 1.5 – 10 tonnes plant, we're adopting machinery with more sustainable power sources including electric fork lift trucks, excavators, dumpers and telehandlers as well as working with our plant operators to make sure our plant is used efficiently.

Using our telematics system, we make sure our machines are well maintained and performing at their best. The system notifies and alerts our maintenance teams and drivers of the need for routine and critical maintenance to ensure the plant is running efficiently and not using excessive amounts of energy. It also provides insights on how machines are being used to help our project teams to optimise their use and reduce time that a piece of plant spends idling or being non-productive.

As well as making sure we have low or zero emission, well maintained plant on our projects, we are also working with plant operators to help them to operate the plant efficiently, including adopting new technologies that prevent our teams from over digging. In partnership with Flannery, we have established our Operator Skills Hub that uses the latest technology to provide training schemes that help reduce carbon emissions by focusing on improving the efficiency of operators to help them complete their tasks in the most fuel-efficient way.

Low carbon electricity powers mini diggers on the A63

On the A63 Castle Street Scheme in Hull, we have been using electric mini diggers to complete archaeological works. Charged via a Prolectric ProPower Solar Generator, the electric diggers have reduced our carbon output by 25 tonnes and, compared to traditional excavators, have provided other benefits including better air quality for those working in the vicinity of the excavators due to zero tail-pipe emissions being emitted.

Coming soon.....

Our in-house experts in our Asset & Technology Solutions business are developing a plant profiler tool to analyse the lifecycle carbon benefits of adopting new technology and innovative solutions. The tool will help to speed up the adoption of new lower carbon plant as well as assisting our teams in selecting the right piece of plant for their needs.

Our Site Mobilisation Hub will begin using the tool in mid-November and it will be available across the business shortly afterwards.

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Plant 1.5 — 10 tonnes energy sources

	What's available[1]	Energy source	Fuel availability and how to access
Zero carbon	Electric excavators, fork lift trucks, dumpers, telehandlers, remote mapping and compaction	Balfour Beatty contract renewable electricity	Our supplier only provides renewable electricity. Please contact the Site Mobilisation Hub to use.
		Green hydrogen for electricity generation	Green hydrogen trials are underway, please contact the Energy team for more information.
Low intensity	Electric excavators, fork lift trucks, dumpers, telehandlers, remote mapping and compaction	Low carbon blue hydrogen for electricity generation	Please contact the Energy team for more information and supplier options.
		Grid average electricity	Only used if there is already a non-Balfour Beatty electricity supply in place. Please speak to the Site Mobilisation Hub to explore if you can use Balfour Beatty contract electricity.
Medium intensity	Traditional plant	Diesel & battery hybrid	Diesel available via our bulk fuel supplier, Certas.
		Diesel, battery & solar hybrid	Diesel available via Certas. Battery and solar options used to lower diesel usage are available via the Plant Hire desk.
	Electric excavators, fork lift trucks, dumpers & telehandlers	High carbon blue hydrogen for electricity generation	Please contact the Energy team for more information and supplier options.
	Fork lift trucks	LPG	Available via our bulk fuel supplier, Certas.
High intensity	Traditional plant	Diesel	Available via our bulk fuel supplier, Certas.
		HVO[2]	HVO must only be used by exception, please contact our Procurement team for prior approval.
	Rail plant	GTL	Available via our bulk fuel supplier, Certas. Internal approval from the Procurement team is required prior to purchasing GTL.
	Electric excavators, fork lift trucks, dumpers & telehandlers	Grey and brown hydrogen for electricity generation	Please contact the Energy team for more information and supplier options.

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1 - All plant and equipment is available from the Plant Hire desk who you can contact on 01142 329 760.
2 - Based on the 2022 DEFRA average GHG emissions value for HVO fuels, which includes the emissions released during the combustion of fuel. It does not account for the unknown impact of HVO on forest clearance and marshland drainage.

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Our fleet

The transition of our fleet of company cars, light commercial and heavy good vehicles to lower carbon energy sources is well underway with a range of electric, hybrid and alternative fuel solutions being adopted.

With the UK Government announcing the end of sales of new petrol and diesel cars by 2030, we are aiming to have a fully sustainable car fleet, made up of electric, PHEV, hybrid and RDE2 vehicles by 2024. To achieve this, we have widened the range of manufacturers that we work with to include more fully electric vehicles in our company car list. We've also set out our policy for the deployment of electric vehicle charge points and formed partnerships with EV Box and GeniePoint to provide charging infrastructure across our sites, offices and depots.

We're making good progress in transitioning our light commercial vehicles to more sustainable alternatives although progress is not as fast as it has been with our company car fleet due to less options being available. As new options emerge, we're working with manufactures to trial them, including trialling one of only three Ford E-Transits in the UK before adopting them more widely. Today, we have fully electric options for small and medium sized vans and dropside pick-up trucks and we will continue to improve the range of options we offer as more become available.

Transitioning our heavy good vehicles to more sustainable energy sources in the long-term will require a combination of solutions including hydrogen and fully-electric vehicles. Whilst these solutions are not widely available today, we're working closely with manufacturers to trial new technologies including hydrogen fuel cells. We're also working closely with partners who will be able to convert our existing heavy good vehicles to more sustainable energy sources.

Did you know?

We removed all petrol and diesel internal combustion engine cars from our company car list in 2021, ahead of the UK Government banning their sale in 2030.

Successful trials help to decarbonise our fleet

Working in partnership with Ford, we trialled the new Ford E-Transit on our Central Rail Systems Alliance (CRSA) contract ahead of its UK wide launch.

The 3.5 tonne prototype vehicle was trialled at CRSA's Crewe office, replacing a fossil fuel vehicle that was used for planned works including vegetation clearance as well as trips to builders merchants to collect tools and materials as required.

Taking advantage of the existing electric vehicle chargers at the office, adopting the new E-Transit removed the need for 167 litres of diesel and the emission of 890kg of CO_2 emissions on an average month.

Following the successful trial of the vehicle, we're now able to offer small, medium and 3.5 tonnes electric vehicles in place of their traditional diesel models.

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Our fleet energy sources

	What's available[1]	Energy source	Fuel availability and how to access
Zero carbon	Fully electric company cars and light commercial vehicles	Balfour Beatty contract renewable electricity	Our supplier only provides renewable electricity. Please contact the Site Mobilisation Hub to use.
		Green hydrogen for electricity generation	Green hydrogen trials are underway, please contact the Energy team for more information.
Low intensity	Fully electric company cars and light commercial vehicles	Low carbon blue hydrogen for electricity generation	Please contact the Energy team for more information and supplier options.
		Grid average electricity	Only used if there is already a non-Balfour Beatty electricity supply in place. Please speak to the Site Mobilisation Hub to explore if you can use Balfour Beatty contract electricity.
Medium intensity	Hybrid company cars	Petrol & battery hybrid	Fuel purchased directly by an employee and claimed for in line with our expenses policy.
	Light commercial vehicles	Diesel & battery hybrid	Please use a company fuel card.
	Fully electric company cars and light commercial vehicles	High carbon blue hydrogen for electricity generation	Please refer to our electric vehicle charging procedure.
High intensity	Grey fleet (employee owned vehicles)	Petrol	Fuel purchased directly by an employee and claimed for in line with our expenses policy.
	Grey fleet (employee owned vehicles)	Diesel	Fuel purchased directly by an employee and claimed for in line with our expenses policy.
	Fully electric company cars and light commercial vehicles	Grey and brown hydrogen for electricity generation	Please contact the Energy team for more information and supplier options.

Hydrogen explained

The majority of hydrogen is known as grey hydrogen and it is made from a carbon intensive process known as steam methane reformation (SMR). Green hydrogen is produced through a process called electrolysis which is powered using renewable energy. We use green hydrogen and we are working with our partners to help boost demand and increase supply.

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Permanent and temporary buildings

Across our permanent and temporary buildings, we're using a combination of technology and our fuel hierarchy to reduce our carbon emissions. Managing demand is at the top of the hierarchy and we have UK-wide deals in place for electricity, natural gas, petrol and diesel that eliminate or reduce carbon intensity and ensure we source our energy responsibly.

Energy required to power heating, hot water, drying rooms, lighting and equipment across our estate has the potential to be carbon intensive if not managed properly. Taking into account challenges including not always being able to connect to the grid from the outset of a project, varying power demands created by different work patterns and increased electricity demand due to battery powered tools, plant and vehicles, we are using a combination of technology and our fuel hierarchy to reduce our emissions as far as possible. This includes our EcoNet system and EcoSense cabins that manage and reduce demand as well as rolling out energy efficient retrofit solutions such as LED lights with motion sensors and equipment such as printers and monitors that go into sleep mode when not in use.

Our in-house Asset & Technology Solutions team provide traditional modular accommodation that is more energy efficient and provides a better working environment than traditional cabin solutions.

As energy sources for our permanent and temporary buildings continue to advance, we're undertaking trials with hydrogen technology to aid it's advancement and to help remove the barriers to its widescale adoption. Cooking oil derived HVO only remains an option for us in certain circumstances, however, due to uncertainty around HVO supply chains and its impact on the environment, we will only use it if it is requested directly by a customer.

Solar film for modular accommodation

Using solar technology across our permanent and temporary buildings has the potential to vastly reduce our carbon footprint. However, traditional systems that use panels and brackets are not suitable for use on temporary buildings due to their fixings and how the buildings are transported.

To overcome this challenge, we're now trialling a flexible solar film on our Bottesford Modular Depot, with the 13.5kWp system also having a 24 kWH battery to store electricity that is generated when it is not needed within the facility e.g. over weekends.

Leading the way with our EcoSense cabins

In December 2021, in collaboration with Sunbelt Rentals, we launched EcoSenese – a sustainable site cabin design with integrated sustainability and neurodiverse features.

EcoSense boasts a range of sustainable applications and components including occupier-activated extractor fan sensors and lower kilowatt heaters with built-in, self-regulating digital thermostats, all helping to reduce our carbon emissions on site by up to 30%.

When fully rolled out across our projects and sites and combined with the our EcoNet technology, which effectively manages the power supply of site compounds, an additional 4,000 to 5,000 tonnes of CO_2 savings is anticipated.

Did you know?

Our EcoNet technology works silently in the background to reduce on-site carbon emissions by up to 80%. Find out more at www.balfourbeatty.com/sustainability/beyond-net-zero-carbon/ or scan the QR code to watch our video.

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Permanent and temporary buildings energy sources

	What's available[1]	Energy source	Fuel availability and how to access
Zero carbon	Space heating, domestic hot water, drying rooms, lighting & IT services	Balfour Beatty contract renewable electricity	Our supplier only provides renewable electricity. Please contact the Site Mobilisation Hub to use.
	Hydrogen power unit	Green hydrogen for electricity generation	Please contact the Site Mobilisation Hub for lead times and availability.
Low intensity	Hydrogen power unit	Low carbon blue hydrogen for electricity generation	Please contact the Site Mobilisation Hub for lead times and availability.
	Space heating, domestic hot water, drying rooms, lighting & IT services	Grid average electricity	Only used if there is already a non-Balfour Beatty electricity supply in place. Please speak to the Site Mobilisation Hub to explore if you can use Balfour Beatty contract electricity.
Medium intensity	Space heating	Natural gas	Please contact the Site Mobilisation Hub to procure natural gas via our Group supplier.
	Solar Pod 30	Diesel & solar hybrid	Please contact the Plant Hire desk.
	Battery storage - Ingenium 45/90	Diesel & battery hybrid	Please contact the Plant Hire desk.
	Hydrogen power unit	High carbon blue hydrogen for electricity generation	Please contact the Site Mobilisation Hub.
High intensity	Small petrol driven generators	Petrol	Please make local arrangements to purchase petrol from a reputable source.
	Diesel generators	Diesel	Available via our bulk fuel supplier, Certas.
		HVO[2]	HVO must only be used by exception. Please contact our procurement team for prior approval.
	Hydrogen power units	Grey and brown hydrogen for electricity generation	Please contact the Energy team for more information and supplier options.

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Think before you print!

You can find our Sustainability Strategy online at balfourbeatty.com/sustainabilitystrategy

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