



Spotlight on...
carbon reduction

CONSIDERATE
CONSTRUCTORS
SCHEME

Case Study: Bowmer + Kirkland

Best Practice and Innovative Practices

Bowmer + Kirkland has been measuring and managing its carbon footprint for 15 years in partnership with the internationally recognised Planet Mark certification scheme. Through the measurement of carbon emissions data and a specific focus on construction sites, we have successfully reduced our own carbon footprint by at least 5% year on year.

Most recently, we have reduced our carbon emissions by 21% per employee during 2021 and 2022 when compared to our previous baseline year. The reductions achieved are mostly attributed to a reduction in electricity consumption across the regional office locations, projects to optimise heating systems at our headquarters and investment in new efficient space heating systems for all our office locations. Following the measurement of our carbon baseline in 2020, we feel we have a thorough good understanding of our carbon footprint arising from our construction operations, and therefore allows us to understand the enablers to focus on for key carbon reductions during both the construction and operational phase of our Projects.

In 2021, the B+K board committed to a Net-Zero Carbon (NZC) future for our construction operations and formally published our carbon baseline. In 2022, B+K published a detailed NZC roadmap, which identifies the pathway to achieve our "Zero by 40" goal and includes key project initiatives that are now incorporated into our work we control ourselves and for our clients.



Our approach to reducing or eliminating carbon emissions of which are in full control of operations are summarised below:

- **Where no temporary grid connection is available, low carbon fuel (HVO) can be used to reduce carbon emissions by 90%**
- **Where temporary connections can be established, sites will operate on green renewable energy grid tariffs from the grid supply (where applicable).**
- **Use of the award-winning innovative PUNCH Flybrid technology to reduce carbon emissions from tower cranes, hoists, and passenger lifts generators.**
- **Procure B+K newer upgraded ECO and ECO+ cabins which include latest smart energy efficiency technology, including alternative heat pumps to reduce carbon emissions by 50-60%**
- **Consider alternative generator technology such as hybrid battery options to reduce the load allowing a smaller, more efficient generator for site welfare requirements. Right sizing generators and matching supply to demand is a key aspect when preparing to start a new site.**

- **B+K employs Biosite and MSite software on all its significant sites to accurately record all employee project miles, material delivery, and service supplier miles to help measure the project footprint and Scope 3 emissions of each project.**
- **B+K use Smart Waste software on all our projects to track all waste generated on the construction site and monitor disposal contractor compliance and recycling rates.**
- **B+K often achieve recycling rate of approx. 95% through identification of wastes at the start of the projects and collaboration with suppliers to reduce material wastes and any third party packaging waste.**
- **Where appropriate, we support the use of electric plant, such as scissor lifts and FLT loadalls.**

COMMUNICATION

To help us achieve our net zero ambitions, communicating this to our employees and UK construction regions was key. A communication and visual package program were devised and rolled out nationally, targeting firstly our employees and site contractors.

We have produced separate- NZC roadmaps for our fixed office locations, business fleet, and construction sites based on the carbon contribution from each type of emission. Our construction sites have the largest contribution to our measured emissions and therefore we chose to focus our reductions efforts here first.

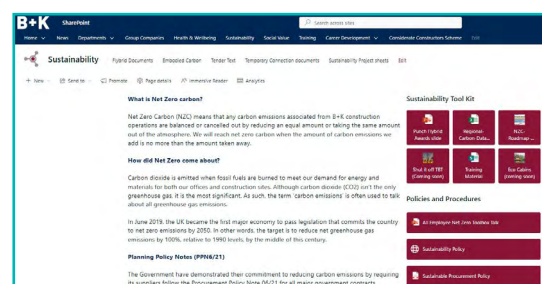
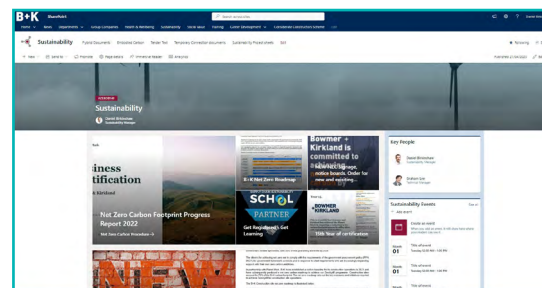
Initially, face to face NZC workshops were undertaken to introduce our new Construction NZC procedure and checklist to all our UK regional teams, which was aimed at our core pre-construction, commercial, QS and design teams. The thought process was that for net zero initiatives to be successfully incorporated into our new projects, our pre-construction (including bid writers and framework) teams would have the largest influence in implementing our suite of carbon reduction initiatives at the earliest possible stages of

any project to allow cost, design and planning to be considered.

Following these targeted workshops, a series of general toolbox talks were undertaken to site teams at our current construction sites with the purpose to communicate the drivers for our NZC carbon strategy and the need for transition to work in a different way, discussion around the measured B+K carbon baseline, the new net carbon procedure, and how this should be implemented and where. We discussed the key low carbon initiatives and barriers, what to expect in the future and what each employee can do to, to drive the “ZeroBy40” program.

In respect of visual communication, we have incorporated our new “ZeroBy40” logo and baseline sustainability data and strategy within our existing environmental notice boards and generated a suite of additional mandatory site notice boards for all site entrances. In addition, we have created a suite of “ZeroBy40” hoarding board banners that can be applied to a range of project site perimeters and Heras fencing products, to communicate the B+K vision to sites, our clients, and the public.

A key part of the communication to employees was to create an internal sustainability hub that all employees can access to share and access key information and policy documents. This allows key NZC documents and initiatives to be showcased and any updates and key information to be shared.



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POLICY

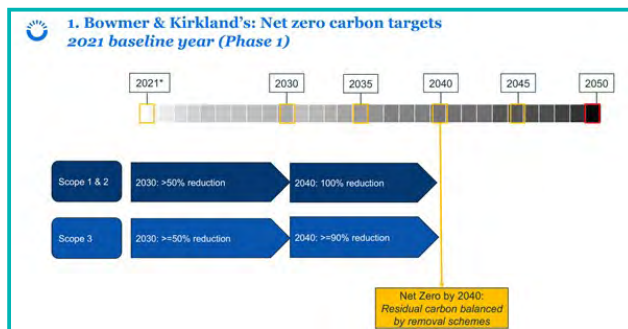
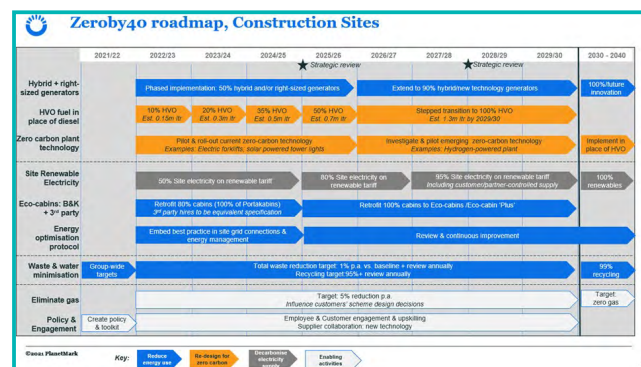
B+K have incorporated many new policies into our integrated management system. However, the main overarching policies are our Carbon Reduction Policy and Construction Net Zero Procedure, which identify and offer practical net zero initiatives to be implemented at the start of each project. This ensures these aspects can be included in preliminary budgets, where measures require lead time and can be planned in advance to facilitate the successful implementation of initiatives (temporary grid connections, etc).

The procedure also introduces a NZC Checklist, which is a helpful crib-sheet that can be used at the outset of the project brief and includes the initiatives set out in the NZC roadmap. This purpose of this is to prompt our bid writers, framework, and pre-construction teams to maximise the implementation of low carbon initiatives are included in our projects where possible.

Some of these low carbon measures are at the discretion of our clients and the planned project timescales and budget, however we try to offer the measures where we have the control. This checklist is a management system audit requirement and is therefore subject to audit to ensure this is integrated and has been assessed before the project has started.

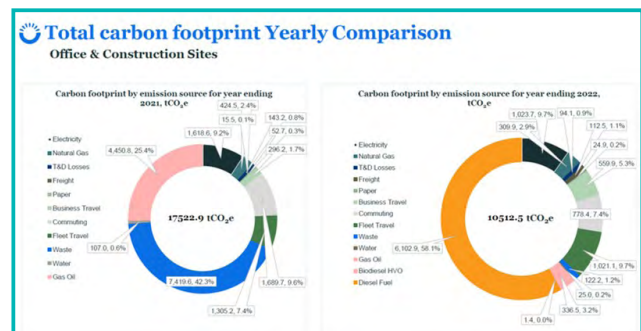
The most recent is the full implementation of SmartWaste, Biosite, and MSite on all our large projects. The SmartWaste ensures that all waste is accounted for from us and our suppliers for each project, which includes disposal routes and recycle rates. In addition to waste, all project site electric, gas, fuel and water consumption is required to be entered for each project monthly, where progress can be measured periodically and KPI status can be reviewed. SmartWaste is also used for collating fixed office consumption also.

Biosite and Msite Delivery Management System software is used to track employees and subcontractor movements and will record the site commute miles as well as the transport miles undertaken to deliver key products, materials, and services to the sites.



MEASUREMENT OF CARBON

B+K has adopted several new software platforms for the purposes of recording carbon data across all its national offices and active construction sites. This software is used to estimate carbon emissions from various sources.



CASE STUDIES

Examples of our most recent innovation and working with industry to achieve carbon savings is our recent work with decarbonising our cabins, focus on reducing embodied carbon and our award winning work incorporating the Punch Power Flybrid and Enertainer system with our site cranes.

LOW CARBON CONCRETE

B+K are partnering with Aggregates Industries to be able to offer a low carbon concrete products in our developments which has a reduced embodied carbon of 30% compared to Standard Portland Cement (CEM1) mix. Concrete products alone can contribute over 80% towards developments total embodied carbon. On larger projects avoided embodied carbon can be further realised by batching concrete on site (or local) to further reduce embodied carbon emissions.

AMPD BATTERY GENERATOR

B+K have partnered with Select to trial a AMPD battery generator to power 2 site tower cranes, eliminating the need for two 500KVA diesel powered generators which would burn 2,750 litres per week emitting 7,205 kgs/week compared to the entertainer emitting 106kg/week.

The Medium Enertainer is a plug and play device designed for the electrification of large construction plant such as tower cranes. The battery is traditionally connected to a mains power supply (which can also be green renewable energy) and trickle charges when not in use. Compared to fossil fuel generators, the Enertainer reduces carbon emissions by up to 98.5% and is significantly quieter, emits zero air pollutants, and eliminates diesel handling.



ECO CABINS

We have extended the range for own employee welfare cabin fleet by upgrading all our standard cabins to a new Eco Cabin standard, which include increased wall and roof insulation, LED sensor-controlled light and enhanced standard heater controls to minimise energy consumption. In addition to this we have introduced an Eco+ range, which in addition to the standard Eco, also include heat pump heating technology, which our trials have achieved a 50% reduction in energy consumption and therefore carbon over a typical year, compared to traditional heating technology. This innovation allows for further right sizing of site power generators, reducing fuel, thus allowing further carbon reduction opportunities.



FLYWHEEL ENERGY STORAGE SYSTEMS

We are now using this award-winning technology, initially developed for Formula 1, to reduce carbon emissions at our construction sites and save fuel/energy costs. Working in collaboration with Punch Power we have trialled their "Punch Flybrid" flywheel energy storage systems to help capture the kinetic energy from tower cranes, storing this energy and then using it on other dynamic equipment on our sites. Having achieved at least a 50% reduction in the size of generators required on these sites, we are rolling out this initiative to all sites with tower cranes, delivering substantial and increased fuel and carbon savings.