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SUSTAINABILITY INFORMATION - BEAM FESTIVAL, HARROGATE

Across 10 sites we are installing 170 lighting fixtures of which 95% of these are LED source. The remaining fixtures utilise the very latest in lighting technology - a Phosphor Laser Source. These are highly energy efficient fixtures compared to the units we were using as little as 5 years ago.

Phosphor-converted laser lighting can be more energy-efficient compared to traditional lighting sources for several reasons:

- **Directionality:** Laser light is highly directional, meaning it can be more precisely directed where it's needed without wasteful scattering. This allows for better control of the light and reduces the need for reflectors or diffusers to direct the light.
- **Spectral Efficiency:** Phosphor-converted lasers can emit light at specific wavelengths, which can be tuned to match the sensitivity of human vision. This spectral precision means less energy is wasted in producing light outside the visible spectrum.
- **Phosphor Conversion:** By using a phosphor to convert the laser light into visible wavelengths, it's possible to achieve high efficiency. Phosphors can convert a broad range of wavelengths emitted by the laser into visible light, reducing losses associated with filtering or absorption.
- **Less Heat Generation:** Laser lighting generates less heat compared to traditional sources like incandescent bulbs or even LEDs. This means less energy is lost as heat, increasing overall energy efficiency.
- **Longevity:** Lasers can have longer lifespans compared to traditional light sources, reducing the frequency of replacements and associated energy costs.

LED lighting is more sustainable and energy-efficient compared to traditional lighting sources for several reasons:

- **Energy Efficiency:** LEDs (Light Emitting Diodes) are highly energy-efficient, converting a higher percentage of electrical energy into light compared to traditional lighting sources such as incandescent bulbs or fluorescent lamps. This efficiency results in lower electricity consumption for the same amount of light output.
- **Long Lifespan:** LEDs have a much longer lifespan than traditional lighting sources. They can last tens of thousands of hours, sometimes even up to 100,000 hours, compared to around 1,000 hours for incandescent bulbs and 10,000 hours for fluorescent lamps. This longevity reduces the frequency of replacements, saving resources and reducing waste.
- **Durability:** LEDs are durable and resistant to shock, vibrations, and external impacts, making them ideal for various applications, including outdoor and industrial lighting. Their robustness contributes to their sustainability by reducing the need for frequent replacements and maintenance.

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- **Instantaneous Lighting:** LEDs reach full brightness instantly when switched on, unlike some traditional lighting sources that may require warm-up time. This feature enhances energy efficiency and convenience, especially in applications where lighting is frequently turned on and off.
- **Directional Lighting:** LEDs emit light in a specific direction, unlike traditional bulbs that emit light in all directions. This directional emission minimises the need for reflectors and diffusers, allowing for better light control and efficiency.
- **Mercury-Free:** Unlike fluorescent or discharge lamps, LEDs do not contain mercury or gas, a hazardous substance that poses environmental and health risks if not disposed of properly. LED lighting is safer to use and easier to recycle at the end of its lifespan.
- **Dimming Capability:** Many LED fixtures are compatible with dimming controls, allowing users to adjust the light output according to their needs. Dimming reduces energy consumption and extends the lifespan of LEDs, providing further energy savings and sustainability benefits.

In addition to the carefully selected lighting products, we are primarily using local power supplies to energise the installations. Mains power is typically more efficient than power generated by other sources. Power providers that supply mains electricity are often larger and more optimised for efficiency compared to individual diesel generators for example.

Mains power, depending on its source, can be generated using cleaner energy sources such as natural gas, renewables (like solar or wind), or nuclear power. Therefore, using mains power can often result in lower greenhouse gas emissions and less air pollution compared to diesel generators.

We are using equipment, materials and staff from local suppliers to reduce transportation-related emissions and support the local economy. Our main supplier is deeply committed to promoting sustainability and mitigating our impact on the environment. They have set a bold target to achieve net zero carbon emissions by 2038.