The Business Case for improving energy efficiency during construction
A cost effective key step in reducing the carbon footprint of the construction process

Benefits of energy efficiency

Straightforward and easy to implement energy efficiencies provide:

- **cost savings** - typically savings are 15%\(^1\);
- **demonstration of good practice** - is an important impact area and a priority for the Strategic Forum for Construction;
- **management of project and reputational risk** – e.g. from potential energy shortage, particularly on sites with no grid supply;
- **demonstration of environmental awareness** - Typically for projects over £1m, energy use is the largest source of construction carbon emissions\(^1\); and
- **environmental assessment schemes** - even the simple step of effectively monitoring energy use on site will deliver direct benefits for many projects by helping secure credits under BREEAM or Code for Sustainable Homes assessments.

Achieving these benefits is **low-effort, low-cost** and involves only effective management of staff and sub-contractors, controlling welfare energy consumption, and specifying efficient plant/equipment. As energy costs continue to rise\(^1\) (see Chart 1) the value of saving energy on site will become more significant.

Analysis of construction carbon emissions identified on site construction activities as being responsible for a third of the sector’s emissions\(^2\). Potential for savings for the sector from on site energy efficiency measures are substantial (see Tables 1 and 2).
Key opportunities to reduce energy use on site

- **Good housekeeping** – ensuring plant and equipment is well maintained and operated correctly can provide savings without incurring any costs.

- **Monitoring and targeting** – monitor overall energy consumption, and sub-metering of key areas such as welfare energy and on-site electricity generators. Tracking usage over time will help identify where energy is being used and will help identify inefficiencies. WRAP’s Resource Efficiency Reporting Portal, the Environment Agency’s Carbon Calculator or other tools can be used to record and benchmark energy use and target energy reductions.

- **Use mains electricity where available** – generator supplied electricity is more than double the cost of grid supplied electricity (based on 2011 median energy prices) and has significantly higher associated carbon emissions.

- **Lighting** – Specifying high frequency ballasts, LED and lower wattage lamps can deliver quick savings of over 20% together with greater lamp longevity.

- **Use energy efficient plant and equipment** – ensure that the energy efficiency is considered when discussing options with suppliers/sub-contractors. Some key considerations for major items of energy using plant are shown in Table 2.

### Table 2: Key opportunities for energy efficiency

<table>
<thead>
<tr>
<th>Source</th>
<th>Saving</th>
<th>Considerations</th>
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</thead>
<tbody>
<tr>
<td>Welfare facilities</td>
<td>~30 to 90%</td>
<td>- Choose – higher specification units with well insulated walls, roofs and floors together with double glazing and efficient lighting. Potential savings of in excess of £1,000 per year per building.</td>
</tr>
<tr>
<td>Generators</td>
<td>up to 70%</td>
<td>- Avoid oversizing – a generator should not be run at less than 30% load (preferably higher than 40%) with maximum efficiency typically above 70% load.</td>
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<tr>
<td>Air Compressors</td>
<td>&gt;30%</td>
<td>- Consider – For every Watt of electricity consumed in a compressor, 90% is typically wasted.</td>
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<td></td>
<td></td>
<td>- <strong>Ensure</strong> – the compressor used matches the actual demand of the tool it is providing; high efficiency motors are used; units have sealed for life bearings; and inlet filters are clear and cleaned regularly.</td>
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<tr>
<td></td>
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<td>- Avoid – hiring units with rewound motors.</td>
</tr>
</tbody>
</table>

References


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