

TESTING AND TRIALLING

Will new building services technologies work for your business?

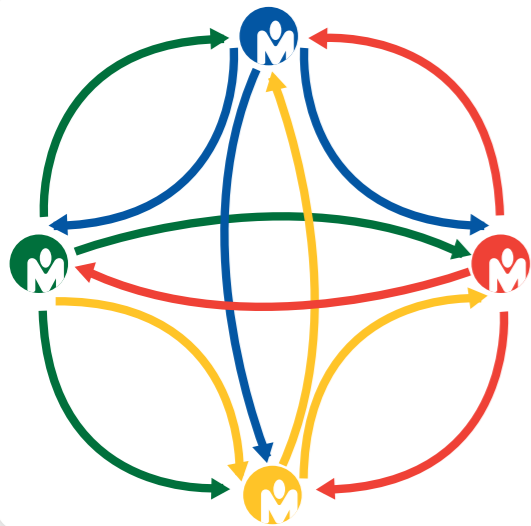
An important part of the work carried out by the Environmental Division involves developing new ideas for clients, presenting outline scenarios on cost and efficiency improvements, carrying out practical installations, monitoring these and proving the benefits.

Recent examples include:

Solar voltaics: Linked collections of photovoltaic modules, made of multiple interconnected solar cells which convert solar energy into direct current electricity via the photovoltaic effect.

Destratification: Warm air heating systems mean it is always hottest at the top of the building. The gradient of temperature across the building is stratified, therefore the installation of low power fan systems moves warm air around the building – effectively achieving more efficient heating without putting more heat in.

Co-generation: Co-generation or Combined Heat and Power (CHP) uses an engine to turn an alternator, generating electricity and capturing by-product heat for domestic or industrial heating purposes, achieving a thermodynamically efficient use of fuel.



Mitton offers the full lifecycle package: With all divisions working as a team

Mitton's four divisions (**Contracting**, **Aftercare**, **Environmental Solutions**, **Air Conditioning**) operate both autonomously and as a team, providing the total building services package.

Sharing expertise and skills enables Mitton to offer cohesive and comprehensive solutions to clients in all corners of industry and commerce.

Expanding the Monitoring Bureau Linking Environmental Solutions with Aftercare

Mitton Environmental Solutions is responsible for one of the largest building management networks in the country, looking after a range of systems from simple installations through to business critical applications and managing over 500 sites across the UK.

Today, Environmental Solutions works increasingly closely with the Aftercare service programme, using building management systems to

check on monitored points prior to scheduled service visits to look in detail and functions and efficiencies and providing a comprehensive report to Aftercare engineers.

These levels of control, monitoring and interrogation give Mitton the opportunity to react quickly and accurately to issues highlighted by the Building Management System.



Mitton Mechanical Services Ltd
Mackenzie House, 451 Cleckheaton Rd,
Low Moor, Bradford BD12 0HS

Telephone - 01274 691177
projects@mittonmechanical.com
www.mittonmechanical.com

Mitton operates nationwide
with offices in Bradford, Northampton
Swindon and Livingston.

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MITTON – FOCUS ON ENVIRONMENTAL ISSUES

Investment in expertise, equipment, facilities and people has placed Mitton in a unique, market leading position to provide a comprehensive, professional mechanical services package to customers nationwide.

From initial specification through to installation and commissioning, from aftercare support through to building management systems, Mitton provides specialised services designed to meet all legislative and operational requirements.

Mitton's Contracting division is responsible for the design and installation of systems, from small contracts to large multi-million pound, multi-site projects. Working with a directly employed team of more than 175 skilled and trained individuals, we successfully bring together significant experience in and understanding of all aspects of building services.

Our Contracting division is backed up by Aftercare, our service and maintenance division which operates nationwide from regional offices in Livingston, Bradford, Northampton and Swindon. We provide both planned maintenance visits and 24/7 emergency call outs, employing over 100 trained and professionally qualified staff and fielding a 4 hour contract call out facility to our installations and clients.

Our core work is complemented by Mitton Environmental Solutions, working closely with clients to assist in reducing carbon emissions and maintaining excellent levels of energy efficiency. Using our engineering expertise and in house building management systems, we also provide effective total site management, detecting and responding to issues before problems arise. Mitton Environmental Solutions also looks into the running costs and possible payback periods of proposals to ensure they are a viable proposition before work commences.

Our newest division, Mitton Air Conditioning, has now been in operation for over two years. The service provided ranges from planned maintenance visits, emergency call outs and tendered work. Systems installed range from simple single split wall or ceiling mounted units, through multi split systems and Variable Refrigerant Volume systems to heat recovery systems and computer hall installations.

With a booming order book for the coming year, we at Mitton are confident of achieving our growth and development targets, as well as opening our doors to new clients seeking to establish positive and mutually beneficial commercial relationships.

MITTON – MONITORING AND RECORDING FOR PERFORMANCE AND EFFICIENCY

Mitton's activities are not just limited to conventional mechanical services – our approach is to look at the entire building and make recommendations for practical improvements that contribute to efficient and compliant operational processes.

Remote monitoring equipment in the shape of temperature loggers is frequently left on site and monitored remotely to record actual maximum and minimum temperatures in line with working requirements.

Energy consumption loggers can also be installed, allowing clients to establish exactly how much energy is consumed by a given system, generating graphical data and evidence to show if systems are working as they should.

SO WHAT'S DRIVING THE DRIVE FOR IMPROVEMENTS?

Work with our clients in many different industry sectors has outlined to Mitton the importance of establishing what the key driver really is for efficiency and performance improvements.

Efficiency comes in many guises, but can be identified by four key drivers:

- The drive to conserve energy
- The drive to save money
- The drive to achieve carbon reductions
- A combination of these issues

A good fiscal saving may equal a reduced carbon saving and vice versa, so Mitton determines the strategy dependent upon the driver and tailors resources to meet requirements and achieve maximum available benefit.

The proof of the pudding

Over the past three years Mitton has assisted a range of clients in reducing their carbon footprints by many thousands of tones.



Working alongside The Carbon Trust

www.carbontrust.co.uk
Mitton only installs systems that are proven to be energy efficient. Enhanced Capital Allowances (ECAs) permit 100% of the capital cost of energy efficient equipment selected from the ETL to be claimed against corporation tax.

Mitton goes a step further too, and can recommend technology so new that it has not yet been accredited on the ETL. Here, Mitton has assessed the equipment and identified that significant savings are possible, opening up new avenues for system performance and efficiency.



With energy efficiency and carbon reduction efficiencies now coming to the fore with the European Emission Trading Scheme and carbon credits, implementing new technology with significantly improved payback may mean that businesses need purchase fewer carbon credits, resulting in potential ongoing savings.

THE GREEN APPROACH IN ACTION

Case Study: Lighting Control System Warehousing Complex

At this 18 year old warehouse, Mitton carried out detailed survey to report on potential reductions in consumed energy. The site had a high base load with minimal fluctuation, demonstrating a slight peak through the working day, dropping slightly at weekends.

- The maintenance/low cost approach of changing existing light fittings for modern HF light fittings and implementing a system of roof light cleaning
- Installation of a full lighting control system

The Mitton Environmental team identified a significant dip in base load corresponding to public holidays when the warehouse was closed and the internal lighting system was turned off.

The client opted for the full lighting control system. This was carried out at a total cost of £18,000, and full payback was achieved in less than six months.

Although a rudimentary lighting control system was installed in the main warehouse, this had a manual override. Tests and evaluations indicated that lighting could be reduced down by at least a third and probably two thirds, with the installation of lighting control to all areas lit by high pressure sodium lighting offered significant potential savings.

At peak daylight availability, this equated to a saving of 30% of building energy consumption.

Mitton recommended a three-way route to the client:

- The 'free win' approach, with staff educated to switch off lights when not required



Case Study: Combined Heat and Power System Morrisons Supermarkets

Although Combined Heat & Power systems were first installed over 20 years ago, today's high performance equipment can yield efficiencies of over 80% and, when correctly implemented, can dramatically reduce energy overheads. In today's climate, this can bring the user advantages in the shape of government incentives including climate change levy relief and enhanced capital allowances, further improving the impact on energy bills.

In line with Morrisons' ongoing strategy of energy conservation and reductions in carbon emissions, Mitton has installed an Ener-G Combined Heat and Power (CHP) unit at the company's supermarket in Thornbury, Bradford, to allow evaluation of the potential contribution of this technology.

The system installed at Thornbury produces 150kW of electrical power and around 231kW of heat, consuming the equivalent of 474kW of gas. Under full load, this produces an efficiency of 80.4%.

It uses a gas converted diesel engine to drive a three phase 415v 150kW generator, which is integrated into the store's electrical systems. Heat generated by the engine is then removed by passing

through heat exchangers on the coolant systems, oil coolers and exhausts, thus giving a direct supply of heat to the store's main heating systems

The exhaust heat exchanger effectively demonstrates the potential power of these CHP systems. Initial tests demonstrated that exhaust temperatures, measured at over 650°C on leaving the engine, dropped to 109°C having passed through the exchangers, giving a remarkable level of heat recovery.

Data so far points to a very successful integration with the existing power and heating systems, with only a negligible increase in exterior noise levels. The payback scenario is at best case 3.16 years, and at worst case 5.3 years, yielding annual carbon savings up to 190 tonnes. The system is being monitored continuously to determine best quality operational parameters.

Morrisons Supermarkets were recently awarded the new Carbon Trust Standard recognising the organisation's commitment to reducing its carbon footprint throughout the business. This Award has been presented to only 12 organisations in the country, and only one food retailer, giving Morrisons a significant lead in the industry.

Case Study: CO₂ Controlled Ventilation System

Demand controlled ventilation is a recent development in HVAC energy saving and control. Instead of a fixed rate of air being forced mechanically into a building by a constantly running fan, the CO₂ levels in a building's internal environment are monitored and then used to determine the output of the ventilation system.

Inverter controlled ventilation systems lend themselves to this technology very well. The ability to constantly vary fan outputs from a very low level mean they can balance the CO₂ being produced by the occupants with the fresh air ventilation requirements. In addition, they will maintain an acceptable environment in the building without constant on/off switching, which is potentially wearing and damaging to components of more traditionally controlled systems.

In this installation, three individual CO₂ sensors were installed at three different points in the building, allowing the average concentration of

CO₂ throughout the building to be used to determine the output of the air handling units.

The benefits were twofold. Firstly, the reduced output of the air handling unit resulted in immediate and measurable reductions in power consumption. Secondly, during the winter months these reduced outputs will mean less cool air being dragged in from outside the building, therefore reducing demands on the heating systems.

Current indications show a reduction of 88% in AHU electrical consumption, with no detrimental effects on interior temperature levels. Expected energy savings in winter months will be in the order of 40%, with maintained low interior CO₂ levels giving scope for further energy savings. Carbon credits will also be saved, further improving payback.

