



AIR CONDITIONING  
OPTIMISATION

# THE OBJECTIVE

Optimising the air conditioning system of your building firstly requires an understanding of how the building is currently used and how the occupants wish to use it. From there we can devise and implement an air conditioning optimisation strategy to deliver what is required, through monitoring, measurement, data collection, data analysis, diagnosis & actions.

The objectives are to optimise the air conditioning system to deliver:

-  The specific environment for the building occupants
-  A more sustainable building
-  Greater energy efficiency
-  Greater value



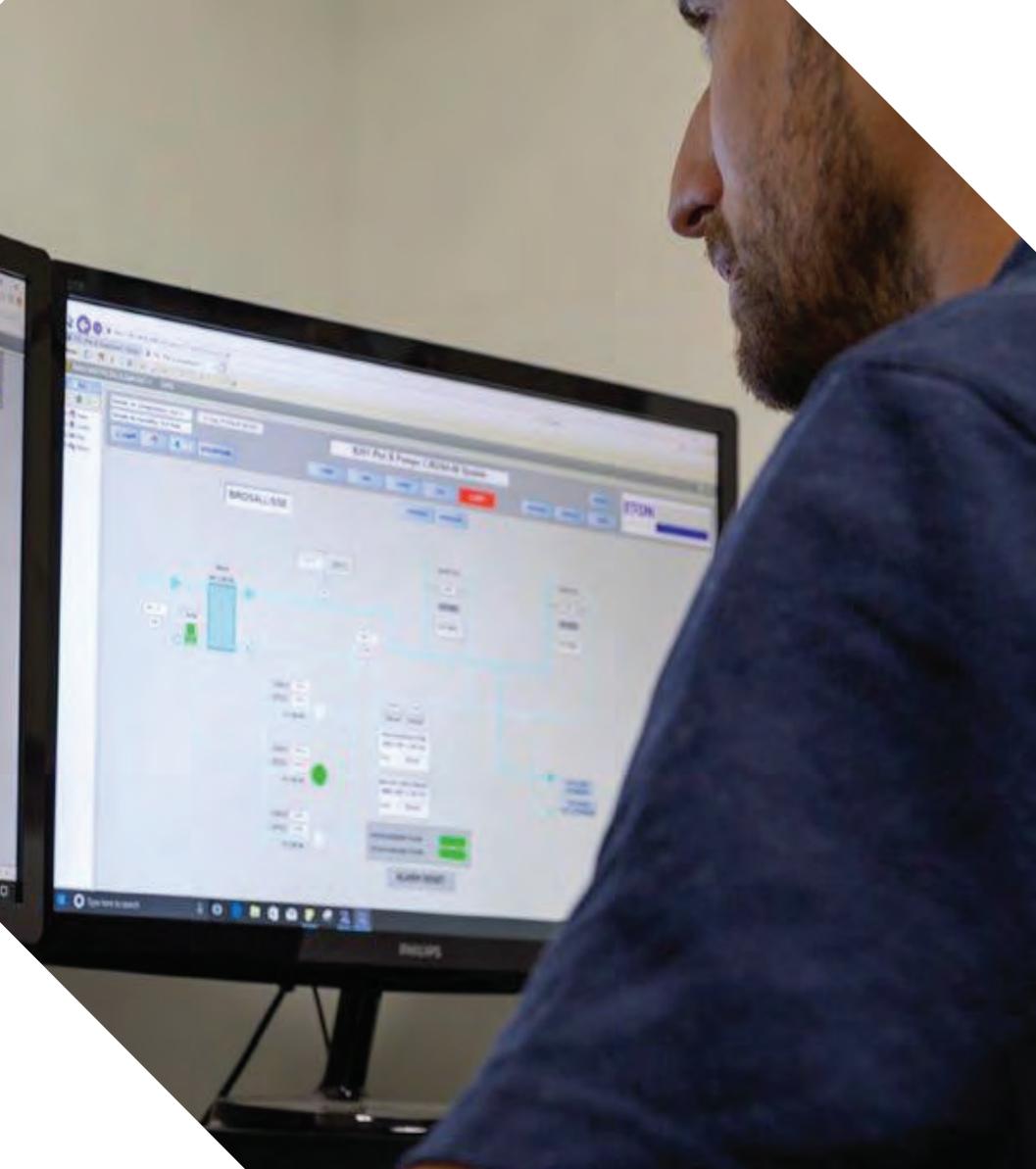


# THE CHALLENGES

The challenges of this type of project are typically:

-  Understanding all the demands of the building
-  Design & efficiency strategy
-  Impliment strategy & behavioural changes
-  Achieve buy-in from all parties
-  Deliver great results





## THE RESULTS

With the operation of an air conditioning optimisation project, the monitoring and control of environmental conditions should significantly improve & achieve the following:

-  15% - 25% reduction in electricity consumption
-  Clear understanding of electrical usage & bills are significantly better
-  Improve the occupants wellbeing
-  Improve the buildings sustainability
-  Return on investment or 2 years

Additional savings can be derived thereafter with improved maintenance. We anticipate call-out and remedial costs to decrease as you utilise the system for remote monitoring, providing further on-going savings & greater reliability.





# ONGOING OPTIMISATION

In a Birdsall maintenance contract we would continue to monitor & adapt scheduling of the air conditioning systems based on occupancy data. This will further minimise energy use and maximise savings. Projects typically identify further optimisation potential in a number of areas of the building that require only minimal further capital costs & behavioural change to deliver and will be implemented in subsequent phases.

1st Floor							
2nd Floor							
3rd Floor							
3 Main 1	3rd Floor	Cool	High	24C	OFF	23.4C	OK
3 Main 2	3rd Floor	Heat	High	22C	OFF	21.2C	OK
3 Main 3	3rd Floor	Heat	High	22C	OFF	22.4C	OK
3OFL	3rd Floor	Cool	Low	22C	OFF	22.1C	OK
3 OFR	3rd Floor	Dry	Low	22C	OFF	21.3C	OK
3 OMR	3rd Floor	Heat	High	22C	OFF	21.8C	OK
3 T Point	3rd Floor	Heat	High	22C	OFF	24.2C	OK
Picadilly	3rd Floor	Heat	Low	18C	OFF	22.3C	OK
Portland	3rd Floor	Auto	High	21C	OFF	23.1C	OK

Figure 4 - An example of a typical screen that can be viewed. This one showing different areas on the 3rd floor of a building along with the status of each AC unit.

Birdsall			ANALYSIS	ALARMS	ADMIN
PERIOD	USAGE	COST			
Previous Day	505 kWh	£ 66			
Month to Date	505 kWh	£ 66			
Previous Month	18,108 kWh	£ 2,354			
Year to Date	165,272 kWh	£ 21,485			
Previous Year	328,952 kWh	£ 42,764			



# THE ACTIONS

- 
 Install a cloud-based energy management system with the link to any existing BMS systems.
- 
 Install wireless environment monitoring hardware throughout the building to measure temperature, midity & occupancy in key spaces.
- 
 Install wireless air conditioning controls hardware to provide remote scheduling capability based on environment conditions.
- 
 Integration with existing BMS to give remote visibility of key systems.
- 
 Set up & configuration of alerts to proactively inform the building managers of important building data (e.g. air conditioning faults, high or low temperatures, excessive energy consumption and other system faults).
- 
 Design of user-friendly homepage with data displayed for use of electricity.



Figure 1 - Copy of typical schedule used to set operating times



Figure 2 - Copy of schedule used for more bespoke operation





## OPERATIONS

The energy management system and software provide greater insight into how energy is consumed across the building and automated control of the air conditioning system to improve building users comfort while also achieving energy savings.

The system allows access to real-time data, enabling management of the energy spend and maintenance regimes in a more proactive manner, therefore optimising the air conditioning systems.

The comparison tools within the portal help to establish site energy base lines and provides a monitoring and measurement platform to verify savings programmes and analyse performance.

Through the monitoring you can pick up data such as:

-  Run times
-  Air temperature
-  Fan speed
-  Fault conditions
-  Mode

You can access the individual AC fault codes to allow diagnosis of faulty plant to be undertaken off site, to reduce time on site & avoid unnecessary site visits if issues can be solved remotely.

You can remotely schedule the operation of the individual AC units & controllers around the site. You can would operate three modes of operation (Normal, Eco, & Off) with a view to reducing AC run times to drive energy savings and a clear Return on Investment for the project.



# CONCLUSION

By controlling the AC, master schedules can be set, amended live at any time and local control can still be granted with regular overrides to prevent large time chunks of overspend.

Measurement of environmental conditions across the site is another key part of the project. This helps to ensure desired environmental conditions are maintained for the comfort of office staff and to provide more data to drive more optimised, automated scheduling of the AC units.

Using temperature set points to drive its operation or occupancy profiles to define more optimised times of operation drives savings and eradicates energy overspend.

The temperature data will also provide the data to explore whether greater savings opportunities are available through turning off equipment for short pockets of time throughout the working day.

The deployment of the portal provides an ability to set up alerts against all monitoring metrics on the portal e.g. AC error signs, temperatures & dirty filters on Air Handling Units.





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