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Data the key to air quality

Concerns over the health and productivity impact of poor air quality have led to a growing demand for monitoring solutions. *Tim Hooper weighs up the options available to energy managers*

Wellbeing standards are driving property owners, property managers and tenants to consider the impact their buildings are having on their employees. Air quality of the building fabric as well as building operation over the long term, need to be measured. There are benefits for many stakeholders, so getting the monitoring right is increasingly important. One thing that is clear, having fit and productive employees is beneficial for both individuals and organisations alike.

The heightened interest in air quality is leading organisations to question what can be done and how they can understand and improve air quality. Participating in one of the emerging standards is an option (Well Building Standard or one of the RESET standards - 'commercial interiors' or 'core and shell') or simply working independently to understand the working environment in more detail.

In all cases, the key to managing air quality in the working environment is data. Much like energy management and metering, data is essential if you are to have any chance of identifying, tracking and quantifying improvements.

It is therefore increasingly important to be clear about your requirements. It may be that an exploratory snapshot of data is sufficient or a fully automated monitoring and control capability is required.

Three areas need to be considered, ideally together as a project. They should not be viewed as and as three separate procurement exercises which will drive costs down but with the near certainty of reduction in usability, longevity and quality. The three are:

- hardware (sensors);
- installation; and
- data collection and integration.



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'The key to managing air quality is data'

Hardware selection should be determined by the match of the specification to requirements. Although in an immature market, greater diligence is needed to ensure the 'end to end' solution meets the project requirements.

Hardware solutions

There are currently two types of hardware solution:

- self-contained ecosystems – comprising of hardware sensors, communications capability, and proprietary app or web dashboard; and
- stand-alone sensors normally fitted with industry standard connectivity (4-20mA, Modbus, etc.) to be used with new or existing data collection systems.

Both types have their merits. The former is usually a nicely packaged and simple to install solution with seamless compatibility to products within the ecosystem. However, it is worth noting that these ecosystems are usually proprietary.

Many ecosystems promise an application programming interface (API) which, in theory, can be easily integrated with other systems. However, it is only true if you have software writing capability and resource to build and maintain

such an interface.

Stand-alone sensors with industry outputs can be read by BMS, data loggers and SCADA systems directly and at whatever intervals suit the user. Some caution should also be exercised with this option as the system being utilised for the data collection may need to be specially configured to talk to the sensors.

A key factor for hardware selection should be dictated by the data it provides and interoperability with future systems i.e. does it provide usable data for different users and systems within the organisation now and in the future?

Installation is an area often underestimated by customers and procurement teams. A good installer, one who is multi-skilled, diligent and committed to the project is invaluable, especially with immature technology.

Understanding the client's requirements, the specifications governing the project (RESET, WELL etc.), and a technical understanding of measurement techniques, should be key attributes of your install partner. Additionally, and probably the most important factor is the

installer's commissioning process. Our definition of 'commissioned' is when sensor data is accurately visible in the end system (screen, report, data base etc). To avoid substandard or incomplete work we would recommend invoice payment only when the system is commissioned.

The final area is data collection and integration. Air quality data in isolation is far less useful than when compared with other driving factors such as occupancy, energy usage, other environmental parameters, BMS data etc. So full consideration should be given to how the hardware/data collection can work with other systems.

If simply trying to get a snapshot of air quality, then portables or small ecosystem solutions might be the best way forward. From the data collected you can make the case for a more robust implementation. For a complete system approach, a sensor network is likely to be required using new or existing data logging equipment. One option is the BMS, although most experiences show BMS systems can be substandard for large-scale data collection, so it is more likely that data loggers will be used.

There are three top tips when it comes to data collection:

- the data collection system must provide data to the client's chosen platforms now and in the future;
- proprietary systems should be avoided in preference for systems that can send standard data to one or many systems; and
- changing analysis platforms should not make your monitoring system redundant or require significant upgrade or reconfiguration.

Some care should be taken to fully understand the total cost of monthly subscriptions. This can often be applied for the eco system software and for an analytics platform. ■