

Achieve more with sub metering

Metering at a 'sensible' level of detail and granularity may be a theoretical no brainer, but in practical terms the need for a sound business case remains in place, says *Tim Hooper*

There is a great deal of highly effective energy management that can be achieved without any additional meters – the tariff gas meter will often suffice for optimising the space heating in a commercial building for example. But there is a great deal more that can only be achieved with a properly designed sub-metering system in place. It is not a coincidence that the revised 2018 edition of ISO50001 is rather more forceful with regard to "Planning for Collection of Energy Data (Section 6.6)" compared to the "Energy Measurement Plan" of the original 2011 version. It is now a requirement to "monitor all Significant Energy Users (SEUs) and to state how and at what frequency data shall be collected and retained."

Were it not for the fact that all SEUs must be monitored, that requirement could conceivably be met using nothing more than the existing fiscal meters plus a clipboard and a biro every month, but the reality is that even for relatively small organisations the march towards successful ISO50001 accreditation is greatly eased, and in some cases made possible by sub-metering. This is before the implications of perhaps the most important of the standard's main tenets is considered – the requirement to "continually improve energy management" which is a great deal easier to write than it is to achieve.

ESOS compliance has also been a driver for the implementation of submetering systems as the information that they provide hugely simplifies the preparation of both reference data and post-implementation performance, particularly for larger organisations.

However, specific initiatives such as ISO50001 and ESOS only provide some additional impetus to the role that metering plays in a long-term energy management strategy. At some point in that strategy the measurement of consumption at department or process level, and the provision of half-hour (or even shorter) interval data becomes

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essential if the best possible performance is to be delivered. That point has always moved in the direction of sooner rather than later as technology improves and hardware prices fall, but several factors have accelerated that process more recently.

Rapidly expanding choice

In pure metering terms, and to focus on just two examples, the relative paucity of MID approved kWh meters for submetering applications has eased considerably, so prices are lower and data connection options broader. The legal requirements surrounding heat metering have resulted in a rapidly expanding choice of lower cost hardware to the considerable benefit of the energy manager. In data and networking the pace of development is even faster with similar cost reductions particularly in the field of 3G/4G communication.

However, while a submetering system is completely dependent on the quality and relevance of the baseline data it obtains (so both the hardware and its installation are of paramount importance) no system is worthy of consideration unless its associated software package ticks all the right boxes also. A detailed analysis of energy management software is an article in itself.

The now almost exclusive use of the web as the delivery mechanism for the desktop interface has created a much wider user base, and software providers have responded to that by creating dashboards and other types of friendly interaction designed to attract and inform a non-expert audience. A much more recent change has been the increased emphasis on the automated gathering of driver data and its incorporation into the software's reporting capability.

The importance of corresponding data for weather, production output, occupancy, footfall and much else with which to factor consumption information has long been appreciated, but this does not give a complete picture. Knowing the energy consumed 'per widget produced' or 'per meal served' is only half the story. The real value is in knowing how much was used as a proportion of how much should have been used given the prevailing circumstances. Or, the mapping of actual consumption against expected consumption.

It is the ability to calculate this key ratio accurately and – critically – automatically which represents the biggest step forward, and it has understandably been enthusiastically embraced by energy stakeholders in all types

of organisation. Often presented as a 'traffic light' or red/amber/green (RAG) report, these are used as a highly effective daily check on performance in manufacturing plants and commercial buildings alike. If amber is treated as the norm, excursions into red or green territory can be automatically monetised and investigated appropriately allowing exceptionally high efficiency levels to be achieved and maintained.

It's a handy example because it demonstrates how far we have come from the standard half-hour bar chart (although they remain as powerful a tool for savings as they ever were) and how integrated a true submetering system actually is. It requires a unique blend of technology in terms of meters, data loggers and networking on the ground; a broad and easily programmed interface for additional data streams such as production and degree days, and clever software that uses well-proven energy management techniques such as regression and CUSUM behind the scenes.

The coming years will see further developments as AI makes strides, but as we go into an uncertain 2019, there is no ambiguity about the role that submetering plays in energy cost control. ■