Driving adoption of energy management system

Improving energy efficiency amongst small and medium enterprises (SMEs) still faces considerable market barriers, especially in the financing of improvement efforts. This is partly due to the impression that improving energy efficiency requires high capital expenditure and is out of reach for most SMEs. However, there exists a wealth of efficiency solutions that can be obtained at low cost that come from behaviour changes or process changes through the implementation of Energy Management System (EnMS).

EnMS is a system of computer-aided tools used to monitor, control and optimise the energy performance of an organisation. Though implementation of these systems can lead to improved energy performance, reaching out to SMEs with customised solutions is expensive and time-consuming due to the size and diversity of the market. One approach to meeting this challenge is for utilities to create an ‘ecosystem’ of market players in a flexible, but well-defined, environment. Several existing programmes can be used to support a simple, performance-based enrolment program, and ensure accurate accounting of energy saving.

Proposed ‘Ecosystem’ to Drive Adoption of EnMS in SMEs

The proposed ‘ecosystem’ to support enrolment in energy management programs consists of the following four elements:

1. Parties that are motivated to implement an EnMS (Enrolees/Customers)
2. Parties that are motivated to ensure that the EnMS is persistent and effective (Enrollers/Utilities)
3. A pool of external consultants who can fill in the expertise gaps when they appear (Consultants)
4. An Enrolment Programme to serve as a backdrop. The Enrolment Program is specifically targeted at small to medium sized operations that might not show an interest in regular energy management programmes.

Further elaboration on each of the elements below:

Enrolees/Customers are any parties interested in implementing an EnMS. They will be required to conform to Programmatic requirements to ensure management commitment to a necessary and sufficient complement of organisational elements and activities to make EnMS success likely. They are also required to commit to periodic performance evaluation and tune up by the Enrollers to ensure that the EnMS remains effective.

Enrollers/Utilities are responsible for ensuring that the EnMS implemented by Enrolees are effective and persistent. Representatives from Enrollers have to perform evaluation of energy savings of Enrolees on a regular basis.
Consultants fill several roles in the Enrolment Programme, with the most critical one as EnMS development support. Other roles that Consultants can play include EnMS trainers, utility personnel trainers, energy modelling trainers, specialty support in energy modelling for Enrolees, and contract performance evaluations for Enrollers.

Enrolment Programme should be performance-based, and not descriptive. Successful enrolment should entail the Enrolee showing persistent progress towards reaching agreed upon EnMS goals. The programme should also be driven by genuine incentives, for example the Enroller utility offering preferential tariff or end-of-year rebate for Enrolees based on their EnMS performance.

Goals and Components of an Enrolment Programme

In general, an EnMS has three goals: Credible energy savings, Continuous EnMS improvement, and Persistence over organisational changes. The following three components of an Enrolment Programme directly address each of these fundamental goals.

Figure 2: Facility-wide baseline energy model has to be created to quantify energy savings efficiently

1. **Facility-wide baseline energy model to provide credible energy savings estimates**: The purpose of this component is to quantify the energy savings in an efficient manner, and obviate the need for intensive measurement and verification on each project. In the process, it also captures behaviour-based energy efficiency gains that might otherwise be unquantifiable and cannot be acquired by the utility. The customer will develop their model in consultation with utility, or the model will be approved by the utility. A credible model is critical to the integrity of the savings estimate, and properly trained individuals are critical to building a credible model.

2. **Minimum EnMS element set that drives continuous improvement**: This element set is meant to ensure that customers do not get complacent with their energy savings and to strive for continuous improvement in energy performance. This include having an energy policy and energy goals, with well-documented action plans to achieve them. Reviews of energy performance should be conducted on a regular basis by the management. Employees of the customers form a powerful resource base which should be utilised in soliciting energy saving ideas. On top of these, data measurement, collection and recording should be kept up with to evaluate the efficacy of the action plans.
3. **EnMS persistence scorecard that ensures energy efficiency survives employee, management, ownership and other organisational turnover**: In case of any organisational turnover, it is important for customers to continue efforts to improve energy efficiency. A scorecard can be used to measure how likely energy efficiency efforts will survive organisational changes. Points are scored for customers whose job descriptions include energy responsibilities, and job performance evaluations that include energy considerations. Points are also scored when customers place energy expenses under department budget, rather than overhead, to ensure that energy efficiency is taken seriously. Having procurement specifications that include energy expenses in a Life Cycle costing model also scores point for EnMS persistence.

**Overseeing EnMS Performance**

To encourage adoption of EnMS by SMEs, utilities will have to offer incentives, for example in the form of rebates or preferential tariffs. However, before doling out such rewards and incentives, utilities require measures of energy savings from their customers of sufficient credibility. The three-prong approach detailed below will provide confidence in an EnMS energy savings estimate.

First, a **disciplined, facility-wide energy baseline model** must be developed by customers, with utility concurrence and support. Application of a facility-wide linear regression energy model, taking into account variables such as production volume, raw material quality, and environmental factors, vastly increases confidence in estimates of energy performance.

Second, utilities and customers need to **recruit the expertise of professionals in energy management**. This ensures that energy modelling, EnMS implementation, and EnMS performance evaluations are held to high standard of competence. This further ensures that energy savings estimated from the baseline model are in fact real and as accurate as possible.

Third, **utilities should get involved in the verification of energy savings**. Representatives from utilities could perform a performance evaluation on a regular basis which would confirm that modelling, measurement and other technical aspects of the EnMS are being properly executed. The evaluation would also assess if the organisational elements of the EnMS are more broadly permeating the organisation, and that EnMS elements remain active and are producing results.

The successful adoption and implementation of EnMS in SMEs require the support of utilities through the creation of an ‘ecosystem’ where customers are able to gain access to expertise and incentives for energy savings. This must be coupled with rigorous evaluation of energy performance improvement to ensure real energy savings and proper disbursement of incentives.
For more on how to drive adoption of EnMS, please visit:


Contributed by H2PC Asia resource team of E2 writers. Please contact byap@h2pcasia.com