California Energy Commission
DOCKETED
12-EPIC-1
TN # 66875
AUG 22 2012

Energy - Docket Optical System

From: Bhupen Mehta (Mehta Associates) [mehta.associates@ymail.com]
Sent: Wednesday, August 22, 2012 1:41 PM
To: Energy - Docket Optical System
Subject: Docket No. 12-EPIC-01

Comments for EPIC program Docket No. 12-EPIC-01
Comments by Mehta Associates and Kumana Associates
August 21, 2012

Background

Mehta Associates and Kumana & Associates appreciate this opportunity to provide comments to the California Energy Commission (CEC) and the California Public Utility Commission (CPUC) for the First Triennial Investment Plan for the Electric Program Investment Charge (EPIC) Program. Mehta Associates (Ben Mehta) and Kumana & Associates (Jimmy Kumana) are small energy consulting service providers to the industrial and utility sectors for several years. Ben Mehta attended via web conference the EPIC Northern California Workshop on August 16, 2012 at Pacific Energy Center in San Francisco.

In compliance with CPUC regulations, IOU Electric and Gas utilities have developed energy efficiency programs. While they have been relatively successful in their lighting and HVAC efficiency programs for buildings, and specialized small industry segments (e.g. retail stores), the success rate with heavy energy-intensive industrial plants has generally been very poor.
The challenge is – what are the ways in which Investor Owned Utilities improve the effectiveness of their industrial efficiency under EPIC program ?

Analysis

Historically, utilities have modeled their industrial efficiency promotion programs after their residential and commercial programs. These have typically been focused on lighting and HVAC for buildings, in part because the technologies are simple and universally applicable, and the programs lend themselves to a prescriptive solution, viz. – If you do "A", we will give you a rebate of $ X, according to some defined published formula. This approach works because there is an almost correlation between the action and the result – e.g. if one installs high efficiency motors to replace low-efficiency motors, then assuming the usage patterns remain unchanged, there will be some power savings which can be reliably predicted. It is a simplistic but practical "one-size fits all" solution that appeals to regulators (who tend to be political appointees, and are not known for their technical sophistication) and therefore to management executives in Utility companies.
Unfortunately the same approach does not work for industrial facilities, which tend to be one of a kind, with various different technologies used in unique combinations, and local economics that vary from site to site. Prescriptive approaches do not work well under these circumstances for three important reasons:

1. Lighting, HVAC and other non-process energy typically account for only 1-2% of the site energy costs, and the savings potential simply makes no difference to the plant Profit & Loss. The real savings potential lies in a employing the full spectrum of industry Best Practices such as better process integration (e.g. optimized heat recovery system design, optimized heat and power system design), aggressive mitigation of heat exchanger fouling (including optimized cleaning schedules), optimum management of load distribution among process equipment, selecting appropriate process control schemes supported by adequate instrumentation, regular instrument calibration, leak detection and repair programs, adequate data collection and

ensuring data quality through the use of high-fidelity simulation models, KPI (Key Performance Indicators) monitoring and reporting systems, personal accountability within the organization structure, etc.

2. Actual energy savings are significantly influenced by operating practices, which can over-shadow the potential benefits of better (or worse) process/equipment design, and are therefore harder to predict a priori with a reasonable degree of reliability. In fact, it has been observed that even at the very same plant, the energy KPIs vary from shift-to shift, as different crews tend to run the plant according to their own philosophy and degree of competence. This makes it very difficult to develop rebate programs tied to hardware.

3. Energy saving project ideas is not easily transferable from one plant to the next. Each plant will typically have a unique set of project solutions, totally unlike another plant belonging to the same company that may be producing the identical products from the same feed stocks.

The implications are that any incentive programs must reward actual results, as measured by improvements in average energy KPIs, rather than specific hardware installed by the Customer. To use an analogy with evaluating the effectiveness of industrial safety programs, we must measure output (e.g. lost-time injuries/accidents per unit of production) and not irrelevant effort (e.g. how many safety meetings were held per year, or how many safety brochures were printed).

A second common problem is that Utility companies tend to assign the promotion of energy efficiency to their Account Managers, whose normal point of customer contact is either an electrical technician that deals with meter maintenance or at best a utilities engineer who deals with fuel and electric power issues at the plant. It is normally not part of their job description to worry about site-wide operating costs – that is the domain of the Plant Manager. Therefore, unless the Account Manager is able to engage the Customer's plant manager, and get his buy-in to the program, it is unlikely that any results will be achieved.

What is needed is to design programs that are consistent with the way decisions are made in each specific customer organization, with the issues that drive the organization towards their goals (usually some combination of maintaining production rates, quality and profitability), and allow them to work within their constraints of budget or market conditions.

Proposed Solutions

To achieve significant savings in the range of 10-30% of the base case energy consumption, what is needed are a suite of flexible incentive programs that include the following essential features:

- Establish the realistic practical potential for energy savings
- Set a schedule for achieving negotiated targets
- Reward real results – could be financial incentives, energy cost reduction and compliance with environmental regulations such as AB 32

Furthermore, there needs to be a dialog at sufficiently high levels of the Utility and Customer management, people with Profit & Loss (P&L) responsibility or the mandate to create/nurture a culture of social responsibility, and budgetary decision making authority. Generally this means at least a Plant manager, and preferably a corporate VP. The follow-up should ideally be done between the Energy Efficiency team from the Utility (degreed engineers, supported by a roster of consultants with industry specific expertise) and the Customer's Energy team, ideally including representatives from corporate engineering, plant engineering, and plant operations. They need to understand that the energy efficiency program is supported by the highest levels of their respective managements, and success or failure would have an impact on their career prospects.

Without such alignment between the CEC, CPUC, IOUs and Customer organizations, no program will succeed. Here are some ideas based on our personal experience with a number of US electric and gas companies:

Three levels of assistance:

- Level 1: Preliminary Opportunity Assessment Study – to establish scope for savings, and to make a decision on whether to proceed with Level 2.
- Level 2: Detailed Feasibility Study – this would include definition/recommendation of specific projects and their economics, and establishment of a system for measurement and monitoring performance through energy KPIs.
- Level 3: Project Implementation Support -- Financing for energy projects by IOUs and third party financing and offer to purchase surplus cogenerated power or biogas at reasonable prices

The criteria for selecting identified projects for implementation should be established up-front. We suggest that one such selection and implementation criteria could be based on the following California Global Warming Solution Act (AB32).

California Global Warming Solution Act AB 32

In 2006, the Governor signed the California Global Warming Solutions Act (AB 32). Among other provisions, the Act set the State's greenhouse gas emission (GHG) reduction goals into law. The Act directed California Air Resource Board (ARB) to prepare a Scoping Plan that identifies how best to reach the 2020 GHG limit.

Industrial facilities in California are a large source of GHG emissions. In 2008, these facilities emitted approximately 160 million metric tons of carbon dioxide equivalent (MMTCO2e) emissions annually or about one-third of the total GHG emissions from all sources in California. The proposed regulation will apply to California's largest industrial facilities; those emitting GHG emissions of at least 0.5 MMTCO2e annually and any cement plants or transportation fuel refineries that emit GHG emissions of at least 0.25 MMTCO2e annually. Based on this threshold and the 2008 data, approximately 60 facilities in five industrial sectors are affected. These sectors include:

- Petroleum refineries (18 facilities)
- Oil and gas extraction and transmission facilities (6 facilities)
- Electricity generating facilities (18 facilities)
- Cement plants and mineral plants (11 facilities)
- Hydrogen plants (3 facilities)

The proposed regulation has three key elements:

1. Analysis of the facility energy consumption and emissions;
2. Analysis of the potential for energy efficiency improvements that will result in GHG emission reductions, with additional quantification of associated reductions in criteria pollutants ;
3. Comprehensive report, that would be submitted to ARB containing the information gathered from the two elements above.

Facility operators have completed these requirements and have submitted to ARB the Assessment Report containing the facility's energy consumption and emissions analysis and the energy efficiency improvement analysis. Once ARB staff has completed review of the submitted reports, they will be made available to the public on ARB's Climate Change website. It is anticipated that public release would occur in August 2012.

Energy efficiency improvement incentive programs for industrial facilities are available through Investor Owned Utility energy efficiency programs such as EPIC program.The utilities often work with a

facility to identify energy savings opportunities, and implementing the project(s) can result in a monetary rebate award. Most of these programs focus on energy efficiency improvements and have not looked at the impact of these actions on criteria pollutant and toxic air contaminant emissions. We strongly recommend that CPUC, CEC, ARB and IOUs make this integration of EPIC program with AB32 goals using the implementation funds and incentives.

Ben Mehta and Jimmy Kumana have presented this approach to ARB technical staff, CEC/PIER program staff and PG&E energy efficiency staff in April 2012. We will be happy to provide additional documents and published studies to support this approach.

Ben Mehta
Mehta Associates
Cupertino (CA)
408-446-2416