

In the early and mid 1990s The Results Center produced 126 case studies of the most successful energy efficiency and renewable energy programs in the United States and around the world. With the support of the John D. and Catherine T. MacArthur Foundation, Ted Flanigan directed a research team at Colorado-based IRT Environment to produce and distribute these exceptional examples.

#116 EXECUTIVE SUMMARY

## BOSTON EDISON COMPANY, LARGE COMMERCIAL & INDUSTRIAL RETROFIT

Boston Edison’s Large C/I Retrofit program for customers that have an average monthly demand greater than 150 kW is an example of a highly sophisticated, but “conventional” incentive-based DSM program. While its generous direct incentives may soon be a thing of the past, many of its program design elements — such as market segmentation, financing options, and verification guidelines — will likely be highly applicable to future programs that will serve both customers’ needs and shareholder profitability in the future.

The Large C/I program exemplifies a refined approach to market segmentation and customer financing options. For instance, a customer can elect one of three program tracks depending on the complexity of his or her retrofit. The program is further subdivided based on whether or not the customer is an institutional or non-institutional customer, since institutional customers tend to have even more restricted access to capital than their private-sector counterparts. Furthermore, while the utility has been increasing the required customer contribution over time — and BECo plans to require a 100% customer contribution by the year 1998 — customers have had two basic fundamental options: They can either utilize the program’s 100% financing option and receive smaller incentive rebates, or they can finance the retrofits independently and collect a commensurately larger incentive. In fact, staff consider three important parameters for incentive payments: who pays for audit costs, the timing of payments, and incentive levels. Institutional customers, for example, can finance audit costs. Non-institutional customers, on the other hand, receive incentive payments based on quarterly verification of program savings.

The Large C/I program also has had a heavy emphasis on metered savings using BECo’s Verification Guidelines, a protocol for establishing confidence in program savings. BECo, like many utilities, is moving away from engineering estimates of savings and now demands greater accuracy and consistency from savings. (A BECo evaluation of school retrofit savings suggested that the utility expected nearly twice the level of savings than it actually achieved.) Thus BECo has placed a great deal of attention on determining “net savings” using rigorous in-house and external evaluations and “true-ups” in subsequent years. Free ridership, for example, has been backed out of program impacts. Through the true-ups BECo has squarely addressed persistence of installed measures. Furthermore, the utility has maintained a keen interest in programs’ load shape impacts.

Despite the program’s basic transition, it has nevertheless racked up impressive impacts. During 1992 and 1993 alone, the program resulted in annual energy savings of 32 GWh and nearly 8 MW of capacity from a total, two-year expenditure of just \$28 million. Lighting accounted for 79% of the savings. The commercial sector contributed nearly 80% of the total savings; within the commercial sector, colleges provided the majority of the savings followed by offices.

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| BOSTON EDISON COMPANY<br>Large Commercial and Industrial Retrofit                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Sector:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Commercial, Industrial                                                                                                                                 |
| <b>Measures:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Lighting, heating, and cooling systems; ventilation, motors, refrigeration, industrial processes, and energy management systems                        |
| <b>Mechanism:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Institutional customers receive rebates after confirmed retrofit savings; non-institutional customers receive progress incentives on a quarterly basis |
| <b>History:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Began DSM initiatives in 1981; created separate DSM planning group in 1984; formed the Pricing, Research, and Evaluation Group in 1993                 |
| <b>1993 PROGRAM DATA</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                        |
| Energy savings:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 22,027 MWh                                                                                                                                             |
| Capacity savings:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 6.25 MW                                                                                                                                                |
| Lifecycle energy savings:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 194,227 MWh                                                                                                                                            |
| Cost:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | \$14,703,300                                                                                                                                           |
| <b>CUMULATIVE DATA</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                        |
| Energy savings:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 41,501 MWh                                                                                                                                             |
| Lifecycle energy savings:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 280,087 MWh                                                                                                                                            |
| Capacity savings:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 7.88 MW                                                                                                                                                |
| Costs:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | \$28,483,500                                                                                                                                           |
| <b>CONVENTIONS</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                        |
| For the entire 1994 profile series all dollar values have been adjusted to 1990 U.S. dollar levels unless otherwise specified. Inflation and exchange rates were derived from the U.S. Department of Labor's Consumer Price Index and the U.S. Federal Reserve's foreign exchange rates.                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                        |
| The Results Center uses three conventions for presenting program savings. Annual savings refer to the annualized value of increments of energy and capacity installed in a given year, or what might be best described as the first full-year effect of the measures installed in a given year. Cumulative savings represent the savings in a given year for all measures installed to date. Lifecycle savings are calculated by multiplying the annual savings by the assumed average measure lifetime. Caution: cumulative and lifecycle savings are theoretical values that usually represent only the technical measure lifetimes and are not adjusted for attrition unless specifically stated. |                                                                                                                                                        |