Making Energy Efficiency Happen: Building Skills on Energy Project Financing

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ABSTRACT

A tremendous body of knowledge exists on how organizations can become more energy efficient. But project identification is only the first step: the real challenge lies in convincing decision-makers to invest in energy management. Yet to date, little or no training exists on building skills on energy project financing.

In January 2005, the Office of Energy Efficiency of Natural Resources Canada, through the consultant Energy Performance Services, began development of the Dollars to $ense: Energy Efficiency Financing Workshop to address this training gap. A needs analysis was performed to ensure that the workshop would build the necessary skills to enable energy project financing. Energy managers revealed that they need to develop the skills to build an energy project business case, and to accurately generate energy savings and cash-flow projections. The workshop design was created to develop these skills and give energy managers the tools to see their projects through to implementation. A take-home calculation tool is the foundation of the workshop, used by participants to analyze the energy savings and cash flows of sample projects funded either through an organization's own capital or through an energy performance contract.

This paper presents the key results of the Needs Analysis and describes the subsequent workshop development and course content. The result is the first workshop in Canada aimed at building skills in the financing of energy management projects for an audience of industrial, commercial and institutional participants.

Introduction

The Office of Energy Efficiency's "Dollars to $ense" Workshops

The Office of Energy Efficiency (OEE) of Canada's federal Department of Natural Resources was established in April 1998 to design, develop and deliver energy efficiency and alternative transportation fuels measures. It administers programs to promote energy efficiency in the industrial, residential, commercial/institutional, and transportation sectors of the economy, and collects and analyses energy efficiency data and trends. Guided by the vision statement of "Leading Canadians to Energy Efficiency at Home, at Work and on the Road," its programs aim to overcome the many barriers to energy efficiency, such as inadequate information and knowledge on energy efficiency, and financial and economic constraints on energy users.

One of the tools to overcome these barriers is the OEE's series of "Dollars to $ense" energy management workshops for industrial, commercial and institutional participants. These three one-day workshops are provided across Canada in both official languages throughout the year. In the *Energy Master Plan* workshop, participants learn to develop, implement and benefit from a comprehensive energy management plan. Participants in the *Energy Monitoring* workshop learn to create an energy use baseline, analyze energy consumption, and implement an

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improvement plan. The *Spot the Energy Savings Opportunities* workshop teaches participants to identify and capitalize on savings opportunities by reviewing energy basics; identifying opportunities in electrical and thermal processes; analyzing incremental energy cost; preparing end-use inventories; and assessing and quantifying benefits.

The numbers show that the Dollars to Sense workshop concept is a successful one: to date, there have been 12,034 participants in 657 workshops since 1997. Approximately 5,364 participants have taken Spot the Energy Savings; 1,954 Energy Monitoring; and there have been 2,447 participants in the Energy Master Plan workshops (the balance of the workshops being customized workshops delivered upon request). The workshops have been held from coast to coast, from Fort St. John in British Columbia, to Labrador City in Newfoundland. Many Canadian organizations (such as Syncrude Canada and Maple Leaf Foods Inc.) have worked with the OEE to tailor the workshops to their needs for delivery within their facilities. Clearly, this training formula is a success: a study performed for the OEE estimated that the Dollars to $ense workshops have led to 3,691 TJ in energy savings and 224 kt of carbon dioxide equivalent per year, in the industrial, commercial, institutional and government sectors (Habart and Associates 2003). The energy savings attributed to attendance at Dollars to $ense workshops since 1997 were approximately $196 million in the 2005/2006 fiscal year.

Why Develop Another Dollars to $ense Workshop?

The OEE has commissioned several studies to help it refine existing programs and develop new ones. These indicate that energy managers face not only technical barriers, but organizational and financial ones as well, in obtaining the capital needed to implement their projects.

Understandably enough, energy efficiency projects tend to have a lower organizational priority than projects with regulatory or legal requirements, or those which create growth (Deloitte and Touche 2002). Energy projects may also have a payback period greater than organizational requirements, and with a lower rate of return. Furthermore, many energy project proponents communicate only the energy-savings benefits of their projects, and could better "sell" their project to senior executives, by citing the low financial risk, decreased waste, improved productivity, decreased emissions, and other social benefits (Guthrie and Mitchell 2005). While third party funding such as energy performance contracting can help address a lack of capital funds, awareness of these kinds of funding options is low, particularly in the industrial sector. Lastly, many business executives simply lack information and awareness of energy efficiency issues, or may believe that energy consumption is a minor, uncontrollable cost of doing business. Thus a technically sound, economically viable energy project may never leave the drawing board due to these barriers.

The above studies are reinforced by the evaluation forms of the Dollars to $ense workshops, which ask "Would you be interested in attending a workshop on financing options/energy performance contracting?" The number of respondents who answered "yes" ranged from 22% (participants in Spot the Energy Savings) to 30% (participants in Energy Monitoring). Furthermore, a Dollars to $ense impact study found that participants in the Energy Master Plan workshop rated financing as the highest learning priority for them, despite the fact that financing is only a small component of that workshop (Habart and Associates 2003).

Thus while the OEE's suite of workshops were ably helping participants to identify energy-savings opportunities and to build action plans, clearly more was needed to help projects

reach the implementation stage. As a result, in early 2005 the OEE initiated the development of a fourth Dollars to $ense workshop on *Energy Efficiency Financing*, through the services of Energy Performance Services Inc. obtained via a competitive bidding process.

Approach to Workshop Development

The objective of the workshop development was to design, develop and pilot test a dynamic one-day workshop (for both the public and private sectors) for an audience of energy managers, project managers, building managers and plant engineers involved in the analysis, recommendation and implementation of financing options for energy efficiency projects. There were 4 phases to the workshop development: the Needs Analysis; Workshop Design; Workshop Pilots; and Evaluation and Revision. The intent was to develop two workshops, presuming that the industrial and commercial sectors would have quite different informational needs compared to the institutional sector, and vice versa. During the Needs Analysis phase it transpired that the informational needs of the public and private sectors were very similar and thus one workshop alone was developed. Needs Analysis results from the private sector alone are reported here.

Needs Analysis Process and Results

The objectives of the Needs Analysis were:

1. To model the competencies of individuals who had successfully obtained financing for energy projects (either via internal financing; or, external financing mechanisms such as energy performance contracting (EPC));
2. To gauge the competencies of the target audience with regards to internal and external financing mechanisms; and,
3. To get direction on the workshop topics that were required by the target audience.

The first step was to perform a literature review of OEE studies related to energy efficiency financing. This background information was used to design interview guides for interviews with energy champions from 18 industrial, 15 public and 4 commercial organizations. Interviewees discussed how they obtained funding for their projects (whether via internal ("routine") financing, or through external ("non-routine") financing), and the barriers they faced in doing so.

Two focus groups were also convened which involved different levels of the company (finance, engineering, and operations) in order to understand the issue from multiple perspectives and to better understand inter-departmental communication issues. Through structured, facilitated discussions, the intent was to gain a clear picture of the interviewee's corporate capital decision-making process and to observe communication between different levels of the organizations. The OEE hoped to define the stages whereby the champion's project moved from initial concept through to financing and implementation, in order to the identify skills required to successfully complete each step.

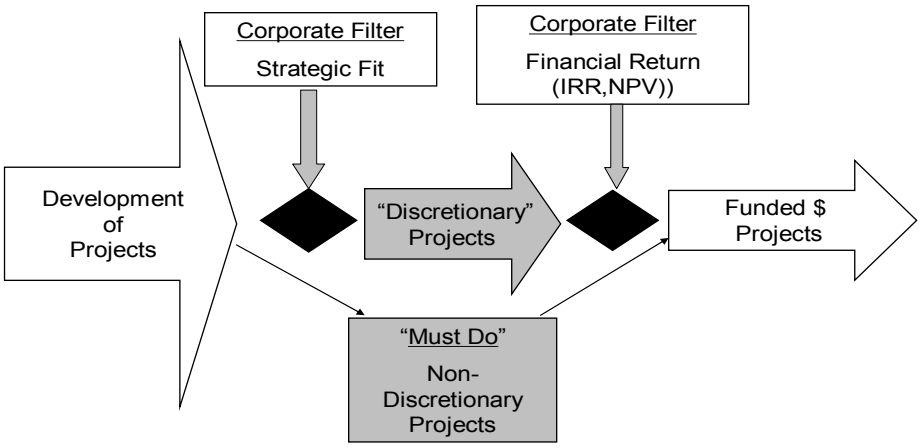
Subsequently, a web-based survey was performed to meet the second and third objectives. Over 700 past participants in Dollars to $ense workshops who had expressed interest in a financing workshop were e-mailed an invitation to participate in the survey. A response rate of over 17% helped to validate the interview results and provide further information on the

barriers to energy efficiency financing, the skills needed to overcome the barriers, and the topics of interest to potential workshop participants. These are detailed below.

The Decision-Making Process

Through the interviews, a consistent picture emerged of the decision-making process for projects requiring capital (Figure 1). First, projects are categorized as either *non-discretionary* or *discretionary*. *Non-discretionary* projects are "must do" projects: they are required to maintain business operations (regulatory compliance, health and safety, repair of critical production equipment etc.). These projects are funded regardless of their economic returns. Many interviewees stressed that in general, most of the available capital goes to non-discretionary projects. The remaining capital is then made available for "discretionary" projects (where choice is involved). The discretionary projects enter the "competition for capital" and are evaluated according to two main criteria: their alignment with corporate priorities; and, their financial performance (typically calculated as after tax internal rate of return (IRR)). Energy efficiency projects are almost always treated as discretionary projects.

Figure 1. The Generic Corporate Decision-Making Process for Funding



While financial criteria (return on investment (ROI), IRR) are the major factor in determining winners, the importance of aligning projects with corporate/strategic priorities is also critical. For example, a production investment project with a high strategic fit and a lower ROI can beat out an energy efficiency investment with a higher ROI. Most interviewees confirmed that production investments are almost always ranked higher than energy efficiency investments. It was also clarified during the interviews that that the decision-makers typically involve representatives from the production, finance and strategic levels of the organization. Each person involved in the decision-making process will bring their own perspective to the table. Those perspectives affect what is deemed to be in "alignment" with corporate priorities.

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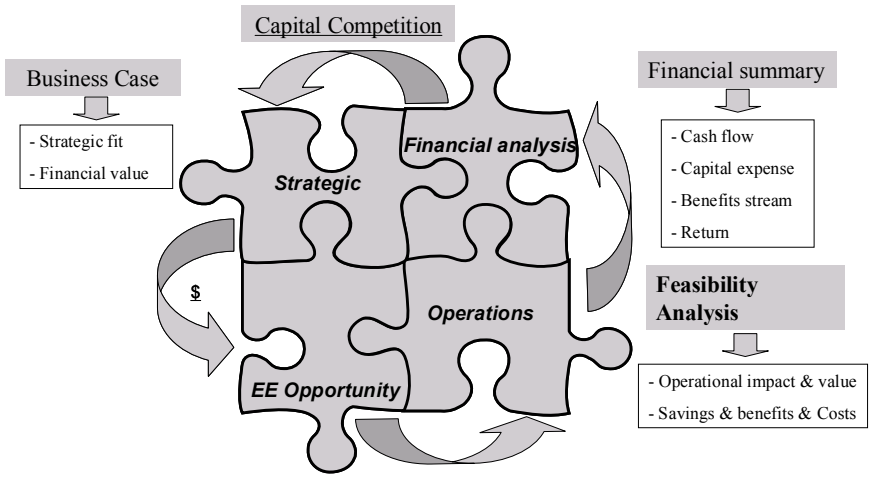
The Project Development Stages

A second intent of the interviews was to understand the process that an energy efficiency project undergoes to move successfully from initial concept to the capital competition. A related goal was to identify the skills needed to successfully complete each step in the process, as surviving the pre-screening process to get *into* the capital competition is no small feat.

While each organization has its unique internal processes, whereby projects move through a series of "gates" before reaching the capital competition, the process described by interviewees is quite similar across organizations (Figure 2). Typically, an energy efficiency project undergoes opportunity identification; feasibility analysis; financial analysis; business case preparation and, if successful, moves on to the capital competition.

The project is evaluated by different decision-makers using different criteria at each stage. Thus in order to pass each gate successfully, an energy project proponent must anticipate the informational needs of each of the decision-makers, and understand the types of "value" they seek, then effectively communicate (in written documents and/or through personal presentations) those values of the project to each decision-maker.

Figure 2. Project Development Process with Decision Points



The interviewees credited their success in financing energy projects to a clear understanding of their decision-making process and their decision-makers. They could then develop clearly defined strategies for selling the value of their energy efficiency projects at the different stages of the process. Furthermore, energy champions communicate proactively with decision-makers during the development phase of a project to increase decision-maker awareness of, and sense of ownership about, the project.

Building the Business Case

Champions also communicated proactively with management in order to understand decision-maker attitudes and priorities and to build support for their projects. They know how to pitch the different kinds of value embedded in a project to the different audiences that will appreciate those values. In addition, they can write concise and effective business cases that communicate this value. They are comfortable making presentations on their projects, either informally or in the boardroom.

Leveraging Opportunities

Champions demonstrated creative strategies for not only trying to win at the capital competition, but in trying to avoid the capital competition altogether. Champions repeatedly explained that it is much easier to fund an energy efficiency project if it is a sub-component of a larger project that has a high chance of success. Champions found that management seems very willing to spend extra money to make a new investment more efficient, whereas there is substantial resistance to spend money on a stand-alone energy efficiency project that involves a modification or retrofit of existing systems.

Demonstrating the Savings

Champions understand that energy savings do not come in a cheque in the mail. Energy efficiency projects avoid consumption and thus create avoided cost. However, this also means that energy bills can still increase following a successful energy project (due to increases in energy costs, and/or increases in overall facility usage). To avoid this scenario, champions take the time to make it clear to decision-makers how the energy efficiency savings will be measured and tracked, and to differentiate between consumption savings and cost savings. They develop metrics before the project is implemented, so that the value of the project can be clearly identified after installation. The beneficial results of the project are then clearly communicated back to the decision-makers. This positive reinforcement helps to gradually change decision-maker attitudes and thus the organization's culture, by building up perceived credibility of energy-saving projects. Over time, in organizations where the champions were operating, management started asking for more of the energy efficiency projects and was willing to accept longer payback periods for the investments.

Use of Energy Performance Contracting

One of the goals of the Needs Analysis was to determine the extent to which information on EPC should be integrated into the workshop design. Two private sector organizations (and over 10 public sector organizations) were interviewed who had successfully used EPC to finance their projects. As there was no pre-existing process for the use of EPC in the organizations interviewed, proponents had devoted substantial energy to educating and convincing management of the reality and wisdom of using external financing for their energy efficiency projects. In order to do so, EPC proponents tended to follow these stages:

- Building awareness for the EPC Option
- Gaining internal support for the EPC concept, by educating senior management (followed by engineering and operations) on the benefits of EPC
- Selecting an EPC contractor
- Negotiating an EPC contract
- Managing the EPC contract (there was general agreement amongst interviewees who had implemented EPC contracts, that they had underestimated the skill requirements for managing the contract once it was in place)

The major factors driving the use of EPC were:

- The internal route was not an option because of capital budget limitations;
- The prospect of getting renewed energy infrastructure was attractive due to the under-funding of maintenance budgets; and,
- Rising energy costs were becoming a problem.

The capital value of projects financed through EPC was substantially larger than projects financed via routine financing. Whereas the average size of internally financed energy efficiency projects was less than $500,000, the average EPC project was closer to $5,000,000. Interestingly, the same core skills demonstrated in successfully getting energy efficiency projects financed through internal mechanisms were also required to get the go-ahead to use EPC in organizations.

Overall, the primary characteristic of champions that pioneered and expanded the use of EPC in their organizations was tenacity combined with exceptional multi-level communication skills. Champions refused to allow a lack of capital in their internal systems to impede them from implementing energy efficiency projects. They took the initiative to discover the EPC concept, adapt it to their business context, present it to senior management and persisted in overcoming internal obstacles until they succeeded in putting the mechanism in place and building projects.

Suggested Training Topics

The third objective of the Needs Analysis was to identify the target audience's preferred topics for an energy efficiency financing workshop. Web survey respondents ranked their preferred topics regarding *routine* financing, in decreasing order below:

- How to use government and utility financial incentives and support to help build the business case
- Tools for increasing the accuracy of savings estimation and calculation
- Tools and techniques to support the business case for the energy efficiency project
- How to enhance the value proposition of the EE business case from non-energy factors such as productivity improvements, maintenance cost reduction etc.
- How to communicate and sell the business case internally
- How to create an EE savings cash-flow and calculate ROI, IRR using spreadsheets
- Understanding EE financial risk analysis
- Understanding the tax treatment of EE investments

The list below illustrates the ranking provided by the interviewees of potential training topics on *non-routine* financing mechanisms:

- Contract overview of the financial aspects of an Energy Performance Contract
- Energy Savings cash-flows and payments under an EPC
- Risks and problems under EPC
- Financing and accounting treatment of an EPC
- Information and analysis requirements to get organizational decision-making approval for EPC
- Understanding EPC from a finance perspective
- Making the EPC business case to financial managers

Survey respondents were asked to indicate their interest in receiving training on both or only one of routine and non-routine financing mechanisms. Eighty-five percent of public sector respondents and 72% of private sector respondents stated that they would like a workshop on ***both*** mechanisms.

Workshop Design

Based on the Needs Analysis, the purpose statement for the workshop was formulated thus: "*To facilitate increased investment in energy efficiency projects by increasing participant skills, knowledge and tools related to existing energy efficiency project financing mechanisms*." To achieve this goal, the key findings from the Needs Analysis were translated into workshop design objectives. One of the overall goals of the workshop development was to create a workshop that was dynamic in nature and would appeal to adult audiences, in addition to being effective in building skills in financing projects. As such, the workshop design employs a variety of teaching methods including whole-group lectures, breakout groups, individual presentations, and an interactive Microsoft Excel calculator tool to help build skills in financial analysis.

While the web survey respondents placed a high priority on information on financial incentives from government and utilities, the decision was made by the OEE and EPS Inc. to not include this as part of the final workshop design. Government and utility incentives vary widely across the country and tend to evolve and change with time, making it a challenge to keep workshop content current. Instead of making this a focus of the workshop, participants will instead be directed to the OEE's online database of Canadian energy efficiency programs.

The Decision-Making and Project Development Processes

The Needs Analysis clearly indicated that a solid understanding of the decision-making process is integral to shepherding a project through that process. Thus the workshop design includes these objectives:

- To identify the components and criteria of the capital decision-making process and critical success factors for winning internal capital;
- To develop skills in understanding decision-makers and their decision-making criteria; and,

- To develop skill in identifying and communicating different types of value from the energy efficiency projects in terms aimed at strategic, financial and operating decision-makers.

To that end, the first portion of the workshop addresses these objectives through a whole-group lecture on the decision-making process and the competition for capital, followed by an individual exercise to help participants articulate the many different kinds of value created by energy efficiency projects.

Financial Analysis Skills

The web survey showed that the target audience placed a high value on learning how to increase the accuracy of savings estimation and calculation, how to create an energy savings cash-flow, and how to calculate ROI, IRR using spreadsheets. The workshop thus includes these objectives:

- To apply a process to calculate the economic value of an energy efficiency project by converting estimated savings and cost data into a cash-flow and integrating that cash-flow with decision-maker metrics (IRR, net present value (NPV) etc.); and,
- To apply financial metrics in a simulated "capital competition" to understand the basis for comparing the value of competing projects.

The workshop participants are provided with case studies and the Microsoft Excel "Energy Efficiency Value Calculator." This spreadsheet tool enables participants to quantify baseline energy consumption and costs; post-project energy consumption and costs; and non-energy benefits (such as maintenance savings). The Calculator then projects the first year benefits into a 10-year cash flow; calculates the project cost summary; and converts the benefits cash flow and project cost data into a total project cash flow, while calculating IRR, ROI etc.

The workshop facilitator reviews the concepts of NPV and IRR for the participants, who then work in small breakout groups to calculate the benefits stream and costs (each using a different fictional case study). The NPV and IRR for each case study are reported to the class; breakout groups then use that information to simulate the "competition for capital" and decide which case study projects they would fund within a given budget. This is followed by a whole-class discussion on how to choose between competing projects.

Building the Business Case

As the ability to create and present a clear and compelling business case for an energy project was a key success factor for the champions interviewed, this was incorporated into the workshop design. This workshop component's objectives are:

- To develop skill in communicating the value of energy efficiency projects in the multiple languages of decision-makers (strategic, financial, and operating); and,
- Increase skill in business case preparation and presentation.

Using the case study project's financial criteria as determined by the breakout groups, each individual is given time to create an "elevator speech" on the merits of their case study project. In turn, each participant delivers their elevator speech to an individual role-playing the head of an organization, with feedback provided by the facilitators.

Energy Performance Contracting

Both interviewees and web survey respondents indicated an interest in external financing mechanisms such as EPC. While an in-depth analysis of EPC was beyond the scope of a one-day workshop, nevertheless it was important to respond to this need. Accordingly, a portion of the workshop has these objectives;

- To identify the key financial aspects of an EPC;
- To identify the steps leading up to an energy performance contract;
- To identify the resource requirements, management and decision-making needs under an EPC contract; and,
- To apply a financial tool to simulate EPC's suitability for financing an energy efficiency project.

Following a whole-group lecture to address the first two objectives, participants then re-enter their breakout groups to analyze their case studies as an EPC project, which shows how the financial metrics of their projects change as they move from an internally funded project to an externally funded one. Participants also complete an exercise to identify the many resources required to bring an EPC to fruition.

The workshop concludes with a brief wrap-up exercise, the intent of which is to analyze energy efficiency project cases from a management perspective to make financing decisions that deliver the highest value to the organization. As a class, workshop participants debate the merits of funding their case study either via internal financing or EPC, and discuss the pros and cons of funding projects using these two mechanisms.

Workshop Pilots and Refinement

The workshop design was tested through 7 pilot workshops in late 2005 and early 2006. The first pilot was a half day workshop timed to coincide with the industrial energy efficiency conference *Energy 2005* in Ottawa, Ontario. This workshop enabled the OEE and EPS Inc. to "test-drive" several key concepts that had emerged during the Needs Analysis, and determine how best to incorporate them into the workshop design. Using the feedback from this half-day pilot, the workshop was subsequently tested with audiences composed of OEE staff, and further revised using their feedback. Lastly, the full workshop was tested with audiences composed of our target audience participants: two workshops were held in English in Ottawa and Toronto (public and private sector audiences, respectively); and two pilots were held in French in Montreal (again, for public and private sector audiences).

First of all, the participant feedback confirmed that spending a half-day each on routine and non-routine financing was a suitable approach. Another important learning was that it was more effective to walk participants through the concepts of IEE and NPV using the EE Value Calculator live on the screen, rather than teaching this via a lecture. In addition, the original

design had one person per breakout group present the elevator speech; but during the pilots the facilitators began asking each *participant* to make an elevator speech. This approach was much more engaging and generated lots of energy and enthusiasm in the classroom. The pilots also provided the OEE and EPS Inc. with direction on improving the workshop slides, Calculator Tool, and documents to make the material as clear and as accessible as possible.

Conclusion

Addressing the financial barrier to energy management implementation has long been a strategic priority for the OEE. Aware that clients wanted a workshop on energy efficiency financing, the real challenge was to understand the skills needed to overcome the financial barriers to project implementation, and to develop a workshop based on those skills.

The Needs Analysis gave the important result that when bringing an energy project to fruition, "soft skills" (such as communication and understanding different perspectives) are just as important as the "hard skills" of performing financial analyses. Equally important, energy champions were convinced of the value their energy efficiency project could create within their organizations, and were prepared to exert substantial and sustained efforts to get their projects implemented. A surprising finding was the similarities between the public and private sectors in terms of the needs they articulated in business case development, communication skills, and skills related to the use of EPC.

The final course that was developed combined lectures, breakout group exercises, and individual exercises, with a financial calculator to model case study cash flows. The feedback from the workshop pilots was extremely encouraging. This workshop is becoming another tool for the OEE to use in achieving its mandate, and is the first workshop in Canada aimed at building skills in the financing of energy management projects for an audience of industrial, commercial and institutional participants.

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