What Makes the Canadian ESCO Industry Unique?

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Energy Performance Contracting as practiced by Energy Service Companies (ESCOs) is developing in all parts of the world. Utilities, consulting engineering firms, product manufacturers are all finding opportunities investing in energy savings. Efforts such as the Ontario Municipal Energy Efficiency Investment Facilities set up the United Nations agency, the International Council on Local Environmental Initiatives, are being used a model for increasing international energy efficiency activity at the local level. Municipal, Provincial and Federal Governments are entering into private sector partnerships to stimulate energy performance contracting in their buildings and facilities.

The Canadian ESCO industry engendered positive response from utilities and governments. This paper traces the development of the energy services industry, primarily in Canada and the United States. comparing and contrasting the policy and program environments. It will examine what can and what can't energy services deliver and what roles ESCOs may play in the future of energy efficiency in North America.

INTRODUCTION

''Profiting from Energy Efficiency'' is the title given to ACEEE's 1996 Summer Study on Energy Efficiency in Buildings. My first ACEEE Summer Study was in 1992. At that time, one thing was for sure: energy efficiency was not viewed by many as a business opportunity. Environmentalists and economists had ''conspired'' to provide a rationale for utility financed energy efficiency. Although consultants earned fees, utilities added shareholder incentives to their bottom line and research organizations found new sources of revenue, little attention was given by utilities, policy makers and environmentalists to the idea that energy efficiency itself could be profitable in spite of the existence of a growing energy performance contracting industry. Indeed, the economic barriers to energy efficiency became the major rationale for DSM incentives, some which even exceeded the cost of the energy efficient measure.

Background

Sitting in the audience for the opening plenary of the 1992 Summer Study, I remember the almost visible sigh of relief among my fellow summer study participants when one of the keynote speakers went way out on a limb, or so it seemed at the time, and put forward the notion that the Clinton-Gore Democratic ticket had a real chance of winning the November election. This meant that that the ''ideology'' of energy efficiency would finally become a political reality embodied in government policy, thus freeing up environmentalists and economists from their tireless interventions in state regulatory hearings to put energy efficiency on utility agendas. It finally looked as if energy efficiency were entering the mainsteam of public policy.

Both the political and the policy predictions were correct, but all the economic and environmental justification in the world could not ensure that DSM would remain a stand alone cost item on utility balance sheets, particularly in face of surplus capacity or wholesale competition. and its resulting ''commoditization'' of electricity. Nevertheless the outlook for energy efficiency has never been better. This year's Summer Study title would have had a question mark after it even two years ago, but the continued growth of the energy services industry and its huge global potential has finally achieved the recognition it deserves.

Previously, south of the 49th parallel, energy service companies were considered suspect for making a profit from energy efficiency. Some utilities saw them as competitors to their own DSM programs. Some regulatory requirements to pursue demand side bidding programs which turned many ESCOs into DSM contractors rather than performance contractors. Energy efficiency ''purists'' faulted ESCOs as cream skimmers. At the same time, some ESCOs worried that their business was becoming too dependent on DSM incentives. U.S. utilities and U.S. ESCOs were uncomfortable partners in the DSM business.

In Canada, a different experience was unfolding. On the surface, the Canadian industry looked very much like its U.S. counterpart. It, too, had been borne out of the heady post oil embargo conservation days and also suffered from customer skepticism. But from the start, there was one factor which differentiated the development of the Canadian industry from the US industry: the sponsorship role of the public sector.

SCOPE

This paper compares the development of the Canadian industry from that in the United States from the late 1970's to the present.

METHODOLGY

This paper uses use of both primary and secondary research as well the author's participation in the Canadian industry since 1987 when the Canadian Association of Energy Service Companies was founded. It also makes use of as well as a wide range of research and consulting projects completed by both of SRC Canada, and its former parent company Synergic Resources Corporation with respect to ESCOs, performance contracting, demand side bidding, and. DSM programming.

Some Definitions

Broadly defined, an *Energy Service Company (ESCO)* is a firm that provides energy efficiency and/or load reduction services to end use facility owners. Often ESCOs are equated to energy performance contractor. When energy services are delivered on a performance basis, ESCOs receive their payment from energy bill savings achieved. Building maintenance, co-generation, new technologies and alternative power production may also be included in the range of services.

The concept of ''*performance contracting*'' is deceptively simple: a customer contracts for a specific result, for ***energy performance contracting,*** it is energy bill savings, rather than for specific products or services, which—while they might logically lead to the same result—could still fall short of achieving the designed outcome, i.e. the specified savings. Performance Contractors assume significant risk in linking their compensation directly to results. Such risk creates the highest possible motivation to properly specify, design, engineer, install and maintain savings over the length of the contract.

Attributes of Energy Service Companies

As applied to the provision of energy efficiency services, ESCOs, are defined by the following attributes:

- ESCOs offer complete energy services, including marketing, design capability, installation, financing, maintenance and monitoring of energy management technologies;
- ESCOs offer ''shared savings contracts'', where customers effectively pay for energy services from a portion of the actual energy bill savings;
- ESCOs get paid on results, although there are various methods used to define results; and
- ESCOs hold most of the performance risk, i.e., the technical, financial and maintenance risk.

How ESCOs Make Money?

ESCOs incur certain costs to implement an energy retrofit project, which then produces a derivative amount of energy savings. Regardless of the type of financing instrument used to fund the project, e.g., shared savings contract, pay-from-savings, or lease, ESCOs effectively share in the resulting savings stream by receiving all or some portion of the resulting energy savings for a contracted period of time.

> *If the Present Value (PV) of the ESCOs effective share of savings over the life of the contract is greater than the PV of all costs, the ESCO makes a profit; otherwise it incurs a loss.*

An ESCOs share of savings typically falls within a range of 50 to 95 percent of savings, with 65 to 85 percent representing the most common range of values. Energy services contracts generally last from 5 to 15 years, with shorter terms being common for private customers and longer ones for institutional and government projects.

There are four general ways an ESCO (and any number of variations) can derive revenue and, if their estimates are correct, a profit:

- **Cost Plus**: Under this arrangement ESCOs derive revenue from the cost to design and install cost saving solutions at a customer's facility. These costs are then marked up to compensate for overhead and profit. Absolute profit then increases with the size of the project. In many respects, this arrangement is a ''cost plus'' process. ESCOs are disciplined to limit costs to which can be paid from savings over an agreed contract term. In this manner, the ESCO is motivated to maximize the number and size of cost effective measures that can be justified by their resultant savings stream. Profit, therefore comes from the following markups on equipment and materials; markups on labour (direct and indirect); and guarantee premiums.
- **Project Financing**: Some ESCOs derive income from the provision of project financing. One US based ESCO is actively pursuing this revenue source in Canada; in effect, acting as the source of project financing and using its engineering skills as a risk management tool for project investment decisions.

- **Fixed Price**: In this arrangement the size of the project and often an annual savings level, is agreed at contract signing. The ESCO can increase income by achieving forecast savings levels, with agreed measures, at less cost than originally estimated.

- **Shared Savings**: In the United States, in the early days of performance contracting, ESCOs did not declare their costs since revenue was derived from sharing in a savings stream with the customer. Thus the ESCO was motivated to keep costs to a minimum and savings to a maximum a feature which drives comprehensiveness of projects. Some ESCOs in Canada also ''share'' in savings that exceed the original targets or estimates.

What Makes ESCOs Unique?

While none of the discrete skills that an ESCO employs are particularly unique, the added value an ESCO brings is its ability to integrate a wide variety of skills, and apply them efficiently to projects ranging from several hundred thousand dollars, to tens of millions of dollars. ESCOs package the following services:

- consulting engineering
- general contracting
- energy analysis
- project management
- project financing
- training
- performance guarantees
- energy monitoring
- savings maintenance and
- risk management.

The most successful ESCOs are generally acknowledged to have the following strengths:

- **Energy systems analysis and technology integration**. ESCOs have learned to analyze energy systems in buildings and industrial processes as thermodynamic systems to enable intelligent selection of a comprehensive package of cost saving options that offer sustainable savings over the long periods.

- **Mobilization and market penetration capability**. ESCOs have shown an ability to implement savings projects quickly and efficiently; they are very effective at lead generation, relationship selling, and know how to access and leverage allies.

- **Financial, legal, and contract capacity.** ESCOs can arrange for sophisticated credit analysis and enhancement, have project financing expertise, can accommodate both simple and sophisticated contracts and are conversant with relevant legal issues.

- **Project and quality management**. ESCOs are expert at subcontractor selection, project and construction management and have learned how to implement quality and risk management controls.

- **Maintaining energy savings**. ESCOs have developed cost effective techniques for measuring, monitoring and maintaining energy savings over time and NAESCO has taken a leadership role in developing protocols for measurement and evaluation.

All ESCOs Are Not the Same!

Each ESCO differs in terms of ownership, target markets, technology focus/expertise, in-house capabilities, etc. Some of the key areas in which ESCOs can be differentiated include:

- **Ownership**: ESCOs may be privately owned, utility subsidiaries or affiliates, non-profit, joint ventures, manufacturers or manufacturers' subsidiaries.

- **Target Market**: During the last several years, some ESCOs have largely focused on market niches; hospitals, schools, government, and by project size.

- **Service Specialization**: Some ESCOs perform project installation using in-house expertise, while others specialize in engineering design and analysis, and still others monitoring and evaluation.

- **Technology**: Some ESCOs display some level of technological bias (lighting, thermal storage, controls), but are increasingly moving toward comprehensive projects.

- **Geographic Preference**: Some ESCOs have established a preference to conduct business in specific geographic regions of one country or countries.

- **Project Financing**: The major determinant of the nature of the financing arrangement is the needs of the cus-

tomer, but ESCO financing capabilities may vary with the financial strength of the ESCO. Those with ''deep pocket'' parent companies typically have a greater capacity to offer off-balance sheet financing. (Off-balance sheet financing is where the building or facility owner can receive investments in his or her facility, but with no financial liability recorded on the organization's balance sheet.) While differences among ESCOs are significant, similarities do not imply that they will operate alike. Some ESCOs have significant, well-established financing capabilities, others have limited in-house financing capabilities; still others have none at all and must arrange financing though their partly lenders and/or other ESCOs. It is important to note that all ESCOs, rely to some extent on third party financing . In fact, most ESCOs do not have internal financing capabilities, but all have access to a variety of funding mechanisms.

Types of Performance Contracts

- **Shared Savings**: ESCO and owner agree to each receive a pre determined percentage of the savings over a set contract period (up to 10 years). The percentage of savings allocated to each party can vary over the period of the contract. The ESCO must ensure that the proceeds its receives will cover the costs it has incurred in implementing the project. In fixed price projects, project costs are not necessarily disclosed.

- **First-Out/Fast Pay-Out**: In this type of contract, all savings accrued over a set period of time (contract length) are used to pay down the project costs. The contract terminates once accrued savings equal the project investment, i.e. the project is paid out or once the negotiated contract period, typically five to seven years ends. If at the end of the negotiated period, the project is fully ''paid out''. Under a ''first-out'' contract, the ESCO receives a fixed profit. If actual savings realized are greater than originally projected, the ESCO project returns do not necessarily increase. In some instances, ESCO and facility owner may agree to share any excess savings achieved in the period from when the project is paid down the end date of the contracted or guaranteed period. Project cost disclosure is important under first out contracts so parties can agree on when the project investment has been repaid.

- **Chauffage (also known in Canada as Guaranteed Savings):** In a chauffage agreement, the ESCO guarantees the facility owner's energy costs will be reduced by a certain percentage. During the contracted period, the ESCO assumes responsibility for paying the owner's utility bills, and the owner agrees to pay the ESCO a percentage of its historical energy costs, for example, discounts of on the order of 15% are typically used. Typically contracts are seven to ten years in length, and from the payments received, the ESCO must recover its expenses and cover the owners utility bills. The ESCO generates a return by ensuring sufficient savings in addition to the discount received by the customer. In France, a service called chauffage, has been used for years: private companies supply and charge for specific building services: heating, light, cooling etc.. They pay the actual utility bills and make money on the difference between what they pay and what they charge.

Development of Performance Contracting

In North America, two divergent paths emerged: one in the US characterized by aggressive private sector firms and the other in Canada characterized by the typically Canadian approach of public sector involvement. Following the 1973 Oil Embargo and the subsequent rapid rise in energy prices, there was a scramble for any technologies that would replace or reduce the use of fossil fuels. Numerous manufacturers promoted products on the opportunity to save more for less. Customers' lack of awareness and the aggressive behavior of some vendors resulted in market confusion and increasing suspicion by customers. Building owners and managers gradually became aware that some vendors failed to account for the interactive, or overlapping effects of some measures.

At the same time, consulting engineers were busy performing energy audits, writing up studies and doing reports. But audits do not always result in projects that are implemented. Besides the confusion of owners and managers with vendor claims and consultants' diverse and capital intensive recommendations, cost was a problem. Faced with large unplanned energy management projects and lack of clarity about which path to take, owners sometimes did nothing, or implemented a partial solutions. Technical uncertainty and large project costs stifled the marketability of energy efficiency. In response to this challenge energy service companies practicing performance contracting emerged, providing the capital for the project and guaranteeing the results. Early projects took place in all sectors, including industrial processes. Driven by the impact of oil price increases, energy performance contracting first developed as a way to introduce alternatives to fossil fuels. It soon began to be used to overcome barriers to the implementation of a range of cost effective energy efficient technologies and practices. These barriers included:

- limited availability of investment capital;

- uncertainty regarding energy conservation technologies and practices;
- lack of motivation among facility owners and
- perceived high risk of project failure.

Industry Development in the United States

Following the 1973 oil embargo and sharp increase in fossil fuel prices, energy performance contracting was used in the industrial sector to replace boilers and other equipment which used fossil fuels. But disputes about who ''owned'' the savings were increasing. Reductions in fuel use both from conversion and changes in industrial output were occurring and other energy prices were also unstable creating measurement and monitoring difficulties in the absence of standard protocols.

In the US, the federal tax code encouraged overstatement of the value of energy conservation equipment in order to reap the benefits of accelerated depreciation. Initially, small aggressive companies with quick profit motives offered ESCO services. Product manufacturers used the concept to sell equipment, sometimes with seemingly inflated promises of performance. Some larger, mainstream companies tried to distance themselves from the concept, pointing to the unethical behavior a few early ESCOs as well a their lack of corporate pedigree. Litigation was reported in the US technical press concerning ''black box solution'' companies who had not delivered on promised savings to customers. Time Energy, Houston, Texas emerged as one of the largest ESCOs operating nationally in the US and internationally. Time Energy had pioneered the ''shared savings'' arrangement and computer generated energy audit reports. Just as Time Energy was to expand into Canada, the company ceased operations as a result of a Security Exchange Commission investigation. The resulting publicity added fuel to the smoldering image of an industry that had yet to earn the confidence of the market.

In 1983, the National Association of Energy Service Companies, (NAESCO), was established to bring some order and credibility to the industry. In its early days, NAESCO suffered an identity crisis, as it sought to determine whether it should serve the interest of the growing independent power industry or just the ESCO community. It opted for the latter and has been a successful advocate for the industry, developing monitoring and verification protocols and playing a major role in the changing relationship to customers and energy utilities.

Development of the ESCO Industry in Canada

In Canada, the early days of the industry took a different turn from that in the U. S. Here, some consulting engineering firms began to experiment with the ESCO approach. In Quebec, ADS and Chalifour and Marcotte, in Ontario, Engineering Interface and Moffat Engineering realized that ''studies and reports'' would have a long life on a shelf somewhere, but achieve few savings. And then, in a typically Canadian way, the public sector got involved with the industry, seeing its potential to support the public policy goals of energy self sufficiency.

Hydro-Quebec joined forces with ADS and created Econoler, a subsidiary of Nouveler, Hydro Quebec's non-regulated venture capital organization with a mandate to invest in high technology, alternative energy and energy management businesses. Econoler grew rapidly and enjoyed rapid market penetration stimulated by government ''off-oil'' programs which provided a range of financial assistance and tax relief for fuel switch to gas or electricity and for insulation upgrades. Annual sales soon reached the tens of millions of dollars. While the majority of projects were in the institutional sector, several projects were undertaken with industrial customers. Econoler's approach was to focus on a particular industry and introduce a new technology.

PetroSave Inc. was established by the Ontario government under the Ontario Energy Corporation, a Crown corporation that held the province's shares in Suncor. PetroSave concentrated on the municipal government market, particularly recreational facilities such as ice rinks. At the same time Imperial Oil was spawning various non-oil related businesses: one an ESCO, Maple Leaf Petroleum (MLP) staffed primarily by Imperial Oil managers and engineers. MLP chose Moffatt Engineering, as its engineering partner. It concentrated on the industrial market in southwestern Ontario, but following a sudden drop in oil prices in the mid 1980's Imperial Oil withdrew from most of its non-oil businesses including MLP. Ironically MLP was just about to sign its largest performance contract with Algoma Steel, a $3 million retrofit of a gas fired furnace.

Meanwhile, the federal government had set up Canertech Conservation. It was to become a national ESCO. A licensing agreement was signed with Econoler to replicate Econoler's business success outside of Quebec. It entered into several major contracts, established a presence in Ontario and Eastern Canada, and raised the credibility of the ESCO business concept with several of the major chartered banks and several provincial governments. Canertech was wound down in the mid-1980's after a change in government. In 1984, Energy Mines and Resource Canada, completed a major study on the opportunities for the ESCO industry in Canada. The

federal government promoted the concept through publications, workshops and funding various studies. Efforts to develop a standard RFP process for federal government buildings met with internal and external difficulties.

By the end of 1985, a number of ESCOs were active in Canada, including: BFR Industries; Econoler; EnerShare Technologies; Engineering Interface (later to be re-named TESCOR); Honeywell Limited; Johnson Controls; Rose Technology; and TransAlta Energy Systems.

Market activity was primarily confined to the institutional sector. The Ontario government held a competitive tender for the Ministry of Transportation's Downsview administrative complex In general, energy efficiency was not a high priority for Canadian facility owners and managers, who had experienced great volatility in oil prices and relatively cheap and stable electricity and natural gas prices.

In 1987, the Canadian Association of Energy Service Companies (CAESCO) was formed with the encouragement of the federal and Ontario governments and Ontario Hydro. The Association has encouraged the orderly growth of the industry through accreditation, support and advice to both ESCOs and customers. Membership in all categories has grown from half a dozen in 1987 to over 50 in 1995. Less than half of CAESCO's members are ESCOs, the remainder are equipment suppliers, utilities, governments, lawyers and consultants.

Both Ontario Hydro and Natural Resources Canada (formerly Energy, Mines and Resources (EMR) have provided direct and indirect financial support to the Canadian ESCO industry association, and have promoted the concept of performance contracting with customer groups. In addition, school boards, associations such as the Federation of Canadian Municipalities, special function organizations like the Ontario Municipal Energy Efficiency Investment Fund, all levels of government, many gas and electric utilities are brokering relationships between ESCOs and their customers first by making their customers aware of ESCOs and performance contracting and bringing ESCOs and customers together.

In addition, natural gas and electric utilities have shown a strong desire to foster market growth in their franchise areas. ESCOs are seen as strategic allies in delivering energy services to customers who are seeking energy efficiency. In some cases, utilities are looking at ESCOs are a component of their customer retention strategy in anticipation of a competitive market for natural gas or electricity, in what is now a regulated monopoly.

The size of the Canadian performance contracting industry in the industrial, commercial and institutional markets is relatively small ($250 million in 1994) compared to economic market potential for their services. According to the Canadian Association of Energy Service Companies (CAESCO), in Canada, the market potential for ESCOs is in the order of several billion dollars.

In Canada, Hydro Quebec, British Gas, Consumers Gas, TransAlta Utilities and Ontario Hydro have all been, or are, directly involved in the ESCO industry. Consumers Gas and British Gas, were former major shareholders in Rose Technology, one of Canada's largest ESCOs. TransAlta operated one of the earliest ESCOs in the 1980's.

Ontario Hydro supported the development and operation of CAESCO in its early years and through its former DSM programs, in particular, the Guaranteed Energy Performance Program (GEPP), is widely recognized as one of the major driving forces to the maturation of the Canadian industry. GEPP developed almost 50 MW of savings during less than three years of operation. When Ontario Hydro developed GEPP, many bidding programs were being piloted in the US and it made little sense to add yet another pilot to the list. Instead, GEPP reinforced the comprehensive and performance guarantee aspect of the general ESCO approach. A CAESCO subcommittee assisted in designing GEPP. It provided incentives that were, on average, richer than the other single measure incentives that Ontario Hydro provided and paid them on a performance basis.

The Canadian government department, Natural Resources Canada has two programs which target ESCOs and is working with the Canadian Federation of Municipalities to replicate its successes. The Federal Buildings Program is aimed at getting as many of the 50,000 federal government buildings as possible into an energy performance contract and has made changes to federal government regulations to provide an more hospitable environment for performance contracts. The Energy Innovators Program signs up major commercial and retail building owners and links them with ESCOs. NRCan has also encouraged the development of energy savings insurance.

The City of Toronto, as part of its commitment to reduce CO_2 emission, has signed deals with three Canadian ESCOs as part of its $30 million program to encourage energy efficiency in Toronto. This is in addition to the 300 MW of savings that Ontario Hydro's DSM program achieved in Toronto from 1991 to 1995.

Recently, across Canada, several utilities are considering ways to leverage the industry to foster energy and environmental objectives within their service territories. At least one, Nova Scotia Power has decided to make a direct entry into the market providing energy services serving markets in Eastern Canada.

What does the Future Hold?

The ESCO industry has evolved significantly over the last decade. The next decade will engender more change. Increased competition and privatization in the electric utility business will continue to expand utility entry into the energy services industry as a way to retain customers and attract new ones to their ''territory'' by helping make their customers' businesses as profitable as possible. And customers in many industries will increasingly use energy efficiency to improve their competitiveness or to increase their flexibility on environmental matters. SRC anticipates that several trends will be seen over the next decade:

- The ESCO industry will grow significantly becoming a multi-billion dollar industry by the next century.
- There will be numerous new entrants into the market, including supply side bidders (independent power producers) and utility subsidiaries. However, only ESCOs with technical strengths, deep pockets (or access to) will survive. If DSM bidding continues in the United States, more and more industrial customers will ''bid'' their own facilities, often with third party assistance.
- Several large multi-national ESCOs will evolve opening up access to large institutional funding pools such as the World Bank, the Asia Development Bank, etc.
- There will be increased polarization in the use of ESCOs to ''deliver'' utility conservation programs; utilities will either strongly support or strongly oppose ESCOs.
- The benefits of utility/ESCO/Customer co-operation will be increasingly recognized.

RESULTS

Why is the Canadian ESCO industry Unique

There are a number of features that characterize the Canadian ESCO industry.

- **Role of Government**: In Canada, the public sector has played a larger role in the development of the industry. Government owned utilities like Hydro Quebec and Ontario Hydro and government departments such as Natural Resources Canada. and the provincial ministry of energy have either created ESCOs or blessed their existence through policy and program initiatives.
- **Accreditation Process**: The industry association, CAESCO, has a process to accredit ESCOs which includes a rigorous review of credentials, project history and interviews of former and existing clients.
- **Open Book**: Most Canadian ESCOs use an open book method sharing information on the various costs and mark-ups on various project components. This encourages larger projects with deeper savings.
- **Utility programs**: The largest utility program which made use of ESCOs was Ontario Hydro's Guaranteed Performance Program. This was not a bidding program. Instead, it reinforced the way ESCOs did business, i.e., on a relationship management basis rather than a transaction basis.