Energy Performance Contracting (EPC) – Key Considerations to Maximize the Benefits

Geneviève Gauthier, National Director
RPIC – Stream 5: Ask the Experts, Ottawa, November 16, 2016
Canadian consulting firm, founded 35 years ago, specialized in the design, evaluation, financing and facilitiation of energy efficiency projects and programs.

Has completed over 3,000 mandates over 30 years.

Has a team made up of 60 experts, including engineers, economists as well as financial and marketing specialists.

Founded in 1996, is specialized in high-quality energy management & energy efficiency training programs.
OUR EXPERTISE AND CLIENTS

› Facilitators for Energy Performance Contracting (EPC)
› Energy Efficiency and Energy Management Plan
› District Energy Systems
› Measurement and Verification (M&V, EM&V, M&T)
› Program Evaluation and Design
› Energy Efficiency Financing (EPC, PACE, OBF)
AGENDA

The Case for Energy Efficiency

EPC at a Glance

Best Practices

Conclusion

Today’s Challenge:
Outline key considerations in relation to the procurement, negotiation, implementation and monitoring of Energy Performance Contracts.
THE CASE FOR ENERGY EFFICIENCY
ECONOMIC BENEFITS

› Projects with Internal Rate of Return (IRR) exceeding the cost of capital are financially attractive

› McKinsey Global Institute *

« The economics of energy efficiency investments are attractive … The average IRR is 17% »
IRR OF BUILDING EFFICIENCY

The internal rate of return (%):
- Cash: 0.3%
- Government Bonds: 2.2%
- Corporate Bonds: 6.9%
- Equities: 6.8%
- Venture Capital: 12.4%
- Individual Firms: 28.4%
- Economy-Wide: 34.7%

Traditional Investments vs. Building Efficiency
MARKET BARRIERS TO EE

Figure 1. What is the Top Barrier to Capturing Potential Energy Savings for Your Company/Organization?
ONE OF THE SOLUTION - EPC

There are no silver bullet to unlocking the energy efficiency and GHG emissions reductions potential

Energy Performance Contracting (EPC) lifts many, but not all, barriers:

› Lack of Capital Budget
› Insufficient ROI
› Uncertainty regarding ROI
› Lack of technical expertise
ENERGY PERFORMANCE CONTRACTING – AT A GLANCE
CURRENT WORLD STATUS

Sub-Saharan Africa:
Kenya – South Africa

Americas:
Argentina – Brazil – Canada – Chile – Colombia – Jamaica – Mexico – Uruguay – USA

Asia-Oceania:

Europe:

MENA:
Israel – Jordan – Lebanon – Morocco – Tunisia
TOP REASONS FOR EPC

- Lack of Capital / Equipment Renewal Needs
- Environmental Stewardship
- Operating Cost
- Improved Comfort / Air Quality
BASIC EPC CONCEPTS

› Transfer of technical and financial risks
› Normally offered by Energy Service Companies (ESCOs)
› Typical services offered by ESCOs include:
  - Design
  - Financing (financing or financing facilitation)
  - Implementation
  - Measurement and verification (M&V) of the performance
  - Training, communication and awareness campaign

› Basic EPC Schemes
  - Guaranteed Energy Savings Contract (GESC)
  - Shared Savings Agreement (SSA)
  - Chauffage
GARANTEED ENERGY SAVINGS CONTRACT

Energy Savings Shortfalls

Engineering, Implementation, M&V, Training

Payment upon progress

ESCO

Payment

Loan

Debt Payment

End-User

Facilitators

Financial Institution
SHARED SAVINGS AGREEMENT

ESCO

Engineering, Implementation, M&V, Training

Shared Savings Based on Performance

Debt Payment

Loan

End-User

Financial Institution

Facilitators
The Federal Buildings Initiative (FBI) is a Natural Resources Canada initiative, implemented in 1991, aimed at assisting federal departments and agencies to reduce the energy consumption and greenhouse gas emissions of their facilities.

› Maintain a list of qualified Energy Service Companies (ESCO)
› Maintain a list of qualified facilitators (such as Econoler)
MAIN EPC STEPS

**Inception**
- Project Scoping
- Procurement
- Feasibility Study

**Implementation**
- Contract Negotiation
- Construction and Commissioning
- Communication and Training

**Reimbursement Period**
- Measurement and Verification of Savings
- Obligations
- Termination
COMMON MISTAKES & BEST PRACTICES
MISTAKES AND BEST PRACTICES

Mistakes with significant technical or financial impacts are made at every steps:

- **Inception**
- **Implementation**
- **Reimbursement Period**

Mistakes can be mitigated by carefully applying best practices.
INCEPTION

Typical Mistakes

› Call for proposals not consistent with the scope of the work.
› RFP assessment matrix inducing bias in scoring
› Overlooking the energy consumption baseline
› Not requiring the M&V plan to be integrated into the feasibility study

Best Practices

› Leverage planned deferred maintenance
› Set IAQ and comfort criteria in the RFP
› Challenge the expected maintenance costs (+/-), stated in the feasibility study, as they are often important but rarely guaranteed
Mistake
The ESCO mentions that the M&V Plan will be completed during the construction period (instead of before its start).

Results
Some data required to properly define the baseline, for instance CO₂ level, could not be retrieved.

Impacts
It is claimed during the reimbursement period that the energy consumption increased to comply with IAQ regulations. No data can back or contradict the claim.
Typical Mistakes

› Proceed to the EPC signature before the feasibility study and the M&V Plan are completed
› Issue the final acceptance of the work before the commissioning and the training are completed

Best Practices

› Carefully read all EPC clauses and seek to understand their implications
› Perform due diligence when accepting change orders
IMPLEMENTATION – CASE STUDY

**Mistake**
Signing the Energy Performance Contract before the detailed feasibility study is completed

**Results**
Unforseen obstacles arising during construction such as presences of asbestos or inadequate electrical installation

**Impacts**
Significant risks of cost and time overruns (missed opportunities)
## REIUMBURSEMENT PERIOD

<table>
<thead>
<tr>
<th>Typical Mistakes</th>
<th>Best Practices</th>
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<tbody>
<tr>
<td>› Approving energy saving reports without understanding them</td>
<td>› Monitor project’s performance on a monthly basis and take corrective actions</td>
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<tr>
<td>› Trigger the early termination clause early into the reimbursement period</td>
<td>› In high employee turnover, ensure proper documentation and knowledge transfer</td>
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REINBURSEMENT – CASE STUDY

**Mistake**

Approving an energy savings report containing unverified baseline adjustments

**Results**

Without the baseline adjustment, the energy savings report would show the project is underperforming.

**Impacts**

The baseline adjustment was not justified, it was an ECM the ESCO had forgotten to implement. The client hasn’t been able to claim their due, i.e. 80,000$
CONCLUSION

› Energy Performance Contracting transfers to a third-party, the ESCO, most technical and financial risks associated to energy efficiency projects

› As any insurance, guarantee or risk transfer mechanism, the devil is in the details and precaution should be taken at every steps

› Professional facilitators can assist you defining, negotiating and managing energy performance contracts
For more in-depth information, register to the March 15th, 2017 Webinar  
http://cietcanada.com/energy-efficiency-training-programs/

THANK YOU ANY QUESTIONS?

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“Having Econoler as a facilitator with this level of expertise has been invaluable to our team as the measures were analysed for technical capacity as well as suitability to the RCMPs long term needs.

Their awareness of the contracting rules and ability to spot the potential risks will ensure that our partnership with the ESCO remains in good standing as this long term partnership moves forward.”

Karen Dupuis  
Royal Canadian Mounted Police (RCMP)
APPENDICES
APPENDICES

› A1: EPC Mode – Comparative Analysis
› A2: Key Contract Considerations
› A3: Roles of Facilitators
EPC MODE - COMPARATIVE ANALYSIS
## PROJECT MODE AT A GLANCE

<table>
<thead>
<tr>
<th>Mode</th>
<th>Details</th>
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<tbody>
<tr>
<td><strong>Traditional</strong></td>
<td>- End user acts as the project manager</td>
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<tr>
<td></td>
<td>- End user takes all technical and financial risks</td>
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<tr>
<td></td>
<td>- End user is responsible for financing</td>
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<tr>
<td></td>
<td>- No performance appraisal (erosion of savings)</td>
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<tr>
<td><strong>EPC Shared-Savings</strong></td>
<td>- Third party acts as the project manager, and assumes most technical and financial risks</td>
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<tr>
<td></td>
<td>- Third party is responsible for financing</td>
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<tr>
<td></td>
<td>- Third party gets paid as a share of the savings</td>
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<tr>
<td><strong>EPC Guaranteed Savings</strong></td>
<td>- ESCO acts as the project manager, and assumes most technical and financial risks</td>
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<tr>
<td></td>
<td>- End user is responsible for financing</td>
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<td>- ESCO guarantees the performance</td>
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KEY PLAYERS IN EE PROJECTS

Traditional
- Engineering firms
- Mechanical and electrical contractors
- BAS providers

EPC
- Energy Services Companies (ESCO)
- Funding body specialized in EE* that will work with ESCOs or players of the traditional market

EPC Guaranteed Savings
- Energy Services Companies (ESCO)

* Such as Efficiency Capital Corporation
PROJECT COST AND PAYMENT

Traditional

- Total cost is unknown until all contractors are selected, and is not guaranteed
- Payment in accordance with the progress of the project

EPC Shared-Savings

- Total cost is unknown until all contractors are selected, but is guaranteed
- Payment is a share of the measured and verified annual energy savings

EPC Guaranteed Savings

- The total cost is known and guaranteed as soon as the ESCO is selected
- Payment in accordance with the progress of the project
## PROJECT DURATION

<table>
<thead>
<tr>
<th>Type</th>
<th>Duration</th>
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<tr>
<td><strong>Traditional</strong></td>
<td>Projects usually stop when all ECMs have been commissioned</td>
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<tr>
<td><strong>EPC Shared-Savings</strong></td>
<td>Project usually stops from 1 to 10 years after all ECMs have been commissioned</td>
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<tr>
<td><strong>EPC Guaranteed Savings</strong></td>
<td>Typically, the project stops after the payback period</td>
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## MAIN ADVANTAGES

<table>
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<tr>
<th>Traditional</th>
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<tbody>
<tr>
<td></td>
<td>› Simple approach</td>
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<td></td>
<td>› Adequacy with standard construction projects</td>
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<tr>
<td></td>
<td>› Lots of providers in the market</td>
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<tr>
<td></td>
<td>› Relatively fast to implement</td>
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| EPC Shared-Savings |     |     |
|                   | › Turn-key projects |     |
|                   | › No performance: no payment |     |
|                   | › Persistence of the energy savings |     |
|                   | › Collateral services: training, awareness, etc. |     |

| EPC Guaranteed Savings |     |     |
|                       | › Payback is guaranteed |     |
|                       | › Total project cost is known from the beginning |     |
|                       | › Persistence of the energy savings |     |
|                       | › Collateral services: training, awareness, etc. |     |
**MAIN DISADVANTAGES**

### Traditional
- Not performance oriented
- No services (training, awareness, optimization)
- Final implementation cost is unknown until the contractors are selected

### EPC
#### Shared-Savings
- Final implementation cost is unknown until the contractors are selected
- Needs assistance to facilitate procurement, implementation, negotiation, and M&V

### EPC
#### Guaranteed Savings
- Takes longer to implement the project
- End user has less to say on the ECM
- Needs assistance to facilitate procurement, implementation, negotiation, and M&V
KEY CONTRACT CONSIDERATIONS
KEY CONTRACT CONSIDERATIONS

› Equipment Ownership
› Malfunctions
› Firm Actions, Damage
› Equipment Selection and Installation
› Provisions for Early Termination
› Conditions Beyond the Control of the Parties
› Indemnification
› Assignment
› Applicable Law
KEY CONTRACT CONSIDERATIONS

› Savings Calculation Formulas
› Calculations of Base Year and Adjusted Baseline
› Energy Prices
› Comfort Standards
› Projected Compensation and Guarantees

All Measurement and Verification (M&V) Considerations for which an International Protocol Exists (IPMVP)
ROLES OF FACILITATORS
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A good facilitator:
› is one that understands your needs and constraints and find the most cost-effective solutions to meet your targets.
› Has a deep understanding of EE, financing mechanisms and M&V

Facilitators can assist with:
› Project planning
› Procurement process
› Contractual negotiations
› Feasibility study and planning stage
› Measurement and verification (M&V)

For usually less than 1 to 3% of the total project cost, you can be assisted by a facilitator for the duration of the project (typically 10-15 years).
That cost could be integrated into the project.
TESTIMONY

“Having Econoler as a facilitator with this level of expertise has been invaluable to our team as the measures were analysed for technical capacity as well as suitability to the RCMPs long term needs.

Their awareness of the contracting rules and ability to spot the potential risks will ensure that our partnership with the ESCO remains in good standing as this long term partnership moves forward.”

Karen Dupuis, Corporate Management & Controllership Branch, RCMP