

Energy Retrofit Project Checklist

You realize that your energy costs are around 30% or more than your overall operating costs. It is time for an Energy Retrofit Assessment! Issue a Request for Qualifications (RFQ) to hire an Energy Services Company (ESCO such as Ameresco) based on experience and references to first assess your current situation then propose a plan to save you money. The process described below is the approach a well qualified ESCO would follow.

Analyze utility bills

- Collect at least 12 months of consecutive bills for electricity and fuel (at least 3 years is preferred to ensure you are choosing a baseline period that doesn't contain anomalies, such as weather)
- Develop a baseline of your energy usage
- Compare your usage to energy or cost benchmarks for similar usage buildings (e.g. equivalent kilowatt-hours/ft²/year or \$/ft²/year)

Physical audit of equipment

- Lights** - record lamp types, number of fixtures, lamp conditions, usage hours, and compare light levels to code
- Major equipment** - list size, manufacturer, type and age (e.g. boilers, chillers, air handlers, pumps, etc.)
- System Schematics** - understand how equipment is integrated into the overall heating, ventilating and air conditioning system
- Operating hours** - record operating hours of all your equipment. Do you have any control systems? How many hours do you run the equipment and how many hours is your building occupied? (e.g. Do the lights go off when there is no movement or when nobody is there?)
- Building equipment** - When was your roof last replaced? Any leaks? Do you have complaints about comfort? Are there any hazardous materials? (e.g. asbestos in the building)

Scope out opportunities

Once you have a breakdown of how much energy is being used and by what systems you can start to calculate potential savings opportunities using a staged approach by looking at loads, then systems, and finally, the plant.

HVAC Measures

- Heat Recovery** - using heat from sources you already have going out and transferring that heat to sources going in
- Equipment Refurbishment** - making your existing equipment operate more efficiently
- Variable Motor Loads** - variable frequency drives for variable motor loads
- Controls** - occupancy-based lighting and ventilation controls - fully automated controls for your entire system
- Solar/thermal** - for domestic hot water

Non-HVAC Measures

- Lighting** - replacing older technology with new, layout redesign
- Envelope** - window replacement/refurbishment, roof replacement, insulation, shading of windows
- Renewable Energy** - solar PV, small wind, micro turbines, geothermal energy

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Retrofit Pick-List

- Determine which of the identified retrofit measures might be applicable to your particular building
- Analyze audit information to identify and calculate energy cost and savings opportunities using the load-system-plant approach (e.g. A sample pick-list would list each measure with cost, expected utility savings and payback period calculated for each)

Financing

- Involve your bank account manager early in the process
- Investigate and determine if any local, provincial or federal government incentives are available for your retrofit
- Work with your bank account manager to determine the best financing options (e.g. lease, term loan, mortgage, operating line of credit)

Implementation

- Develop a strategic approach to implementing your energy retrofit
- Partner with an Energy Services Company (ESCO) to implement more efficiently, faster and create more savings
- Consider an Energy Performance Contract (EPC) with the ESCO that will define the scope, the deliverables, as well as the commercial and technical terms and duration of the retrofit

Measure & verify savings

- Monitor and verify to ensure predicted savings are actually being achieved

Method 1 - Compare utility billing before and after being sure to adjust for load, operational or weather changes

Method 2 - Use point metering to measure pre- and post-retrofit and use sub-metered data to determine usage profiles and savings

- Create a report that compares actual performance against the baseline data upon which you calculated your savings
- Establish measurement as an on-going process to continually identify and use the proceeds from savings to fund the next phase in your retrofit plan