

Renewal of Apartment Building Heating Plants

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Those of us who work in Ontario apartment buildings know that the apartment stock is getting older. The strongest years for Ontario private rental starts were in the late 60's and early 70's, peaking at 38,000 starts in 1972 and then declining after that. The drop-off was dramatic; there hasn't been a single year with more than 5,000 starts since 1990. So in the past 35 years the attention of the apartment industry has shifted from asset creation to asset maintenance, and in recent years to asset renewal.

No part of a rental building is in greater need of renewal than the heating and domestic hot water (DHW) systems. But help is at hand. Our heating plants may be overcharging us for maintenance and fuel, but governments and utilities will pay us to replace them with something better.

During the apartment building boom, there were two heating plant technologies in common use: fire-tube (Scotch Marine) boilers located in the basement and copper-tube atmospheric boilers in a mechanical penthouse. Both types use more fuel than modern boilers and even the most durable had a life expectancy of 30 years. And yet many buildings still have original equipment, subject to frequent breakdowns, emergency call-ins, and very high annual maintenance costs. The equipment is beyond its serviceable life. Some mechanical rooms look like a horror film set, complete with dim lighting, dripping water, crumbling concrete floors and walls, and torn asbestos insulation hanging from pipes and boiler jackets. The lobby might be updated, in response to a soft rental market, but don't look under the hood. (I've even had a rat run across my feet, although that was in a building south of the border. Not yet in Ontario, though I'm guessing that's only because Canadian rats are not as outgoing as their American cousins.)

One popular option is to do nothing. To fix or replace equipment on an emergency breakdown basis. Pumps are rebuilt when they leak or replaced when they break down. Leaky fire-tube boilers are re-tubed and welded at the tube sheets. Atmospheric burners and refractories are replaced when they fall apart. Similarly, basic electric controls are replaced only when they fail. This approach avoids making a single major financial decision, but it becomes less and less workable as the points of failure and the likelihood of serious tenant disruption increase.

A second option is similar to the first, but takes account of fuel costs. It's possible to leave most of an existing plant untouched and replace only part of the boiler capacity with high efficiency boilers. The new boilers carry most of the load through the year. The older less efficient boilers only run to carry the peak load in the coldest months. This option gives the best "simple payback", when calculated only on construction cost and annual energy savings. But it doesn't fix most points of failure, and it doesn't address issues like safety, asbestos, or code compliance. Worse, "plug in" boiler replacements often don't work properly or don't get the savings they should because they don't consider the rest of the heating system. Any major heating plant change should be engineered, not just assembled, with proper drawings and specifications.

A third option involves consideration of the entire plant. It is a carefully planned replacement to eliminate operating problems, maximize energy savings, and extend the life expectancy by a projected time span. High efficiency doesn't have to mean high maintenance or short equipment life, but it's important to spend time evaluating each building individually. Each technology on the market has its advantages, limitations, and areas of best application. Operating problems in retrofit plants are most often due to a lack of

forethought and a poor fit for the chosen equipment. Don't forget that vendors and contractors are in the business of selling and installing, not comparing options and designing.

The Financial Picture

Any decision (or non-decision) should be based on a financial grounding. For **long-term owners**, a life-cycle costing analysis will take into account capital costs for the new system, periodic rehabilitation of the existing system, and recurring operating costs like maintenance and energy. Comparing costs over the planned ownership period will often, but not always, point to a complete plant replacement. In recent years, high quality plant replacements using durable boilers and complete DDC controls with internet access have shown simple paybacks on energy savings in the 7-year range. Incentive grants buy these down to just over five years. And depending on the condition of the existing equipment, life cycle costing can demonstrate that the real payback is even shorter. Pretty good for an asset that's going to last 25 years.

Short term owners have to look at the situation a bit differently. If you're planning to sell in the next few years, your goal would be to get maintenance and utility costs down for a year or two. The lower operating costs would support a higher selling price. This can be a very attractive investment, requiring some advance planning. A typical 200-suite building would typically require an investment of \$350,000, but would add \$600,000 to the property value at a 10% cap rate.

In either case the ROI looks better all the time as energy costs rise.

Incentive Programs and Outside Financing

At the time of this writing NRCan is no longer offering owners incentives under their Energy Retrofit Assistance program, however we're told that there is a replacement program coming. In the major markets of Ontario, Enbridge is offering up to \$30,000 per building under their MultiChoice program which can cover up to 10% of the entire project cost.

Where owners have insufficient equity, or don't want to borrow against it, there are even companies that will buy and operate the new heating plant for the owner and then lease it back on a schedule that preserves cash flow.

Where to Start

The three conditions of aging equipment, increasing energy costs, and conservation grants have come together in Ontario to offer attractive heating plant investments in apartment buildings. These projects don't make sense everywhere, but every owner with buildings over 100 suites in size should at least do a preliminary evaluation. There are independent companies, not associated with equipment vendors or installers, who will take basic building information and do this for you without cost or obligation.

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