Professionally Engineered Heating Plant Renewal

In the new construction market, building permits are required, so there is a legal need for qualified professional engineers to stamp mechanical and electrical drawings. In the retrofit market the work is usually considered repair or replacement, so a permit is usually not needed. That gives building owners the option of avoiding engineers altogether and dealing directly with suppliers and contractors. So why would a building owner hire an engineer?

Building Owners Need Advice They Can Trust

Most building owners will only buy boiler plants once in their lives. So they can't know as much as a company that designs these systems and has seen all of the market choices in operation. They need someone who knows the market and will explain the options and trade-offs in a clear and impartial way. Each owner will have his/her own priorities with respect to payback, durability, operating convenience, budget, and planning horizon. Independent practitioners who spend their careers in this field are in the best position to help.

Building Owners Need Representation

Building owners also need representation to participate in the market from a position of strength. Anyone who has hired a home renovation contractor knows there are plenty of risks and shady operators, and that you should not hire exclusively on lowest price. The same applies in the commercial construction market, only on a larger scale. Just because a contractor is willing to start a project doesn't mean he has the resources to finish it and do it right. When an owner hires an engineer, the engineer is bound by a sworn legal duty to protect his client's interests. That includes advice on which contractors are experienced and capable of getting the job done.

It's Not Expensive

Engineering design and construction quality control services are generally in the range of 10% to 15% of the construction contract. Just knowing the right contractors to invite and the right time of year to schedule the work can save 30%.

Contractors Don't Represent the Owner

Replacing existing systems with high-efficiency engineered systems takes careful analysis and assessment of options. Contractors are not in a position to do this...they will recommend the approach that works best with their business model. That usually means oversized appliances for safety, lowest cost appliances for attractive pricing, and the simplest to install because of the shortage of skilled trades. They may talk about energy efficiency, but any associated business compromises or risks don't make sense for them.

Engineers are hired to represent the owner. Because they are paid only for their time, their recommendations are independent.

Simple Replacements Create Problems

A straight one-for-one boiler replacement can create its own problems. Boiler technology has changed tremendously in the past 30 years, and so have installation and operating

requirements. If the new boilers do not see the correct water flows and temperatures, they will not operate efficiently and may fail prematurely.

A Tender Process Saves Money

It's quite possible to ask a list of construction contractors to quote on a heating plant replacement. Sounds easy enough, but if you haven't precisely defined what you want then you will get several different prices, each price for a different project with different equipment and uncertain quality standards. The quoting contractors know that the only common basis for comparison is the total price, so they will do what they can to get it as low as possible. There is no way to know whether any of the quotes will solve your problems or give you the benefits you expect. There is no way to know which quote is the best value. There is no way to predict the amount of "extras" to come later once the job is under way.

Tendering is the process of requesting competitive pricing for a carefully defined scope of work. A design engineer defines the precise details and quality expectations in a "tender package" consisting of drawings and written specifications. Contractors bid against the tender package, ensuring the best possible market price for a project where equipment and workmanship standards are clearly understood.

Right-Sizing Saves Overall Cost

Most original heating plants are oversized, often twice what is needed, for two reasons:

- The design philosophy of some engineers at the time was to provide full redundancy.
- Before a building is put up, it's hard to know how big the HVAC services need to be. So they were sized for the worst case scenario and then a safety factor was added on top.

When it comes time to replace mechanical systems, utility billing history provides a very good indication of the actual sizing required. We normally analyze that carefully using statistical tools, and add a small margin (say 20%) to allow for some equipment failure even under maximum load.

This "right-sizing" approach cuts the construction cost, typically saving more than the design fees.

When Energy Costs are Cut, Building Value Goes Up

Commercial and apartment buildings are valued based on capitalization rate calculations. A well-engineered $300,000 replacement heating plant will save $50,000 per year in natural gas Based on a cap rate of 7%, that adds over $700,000 to the market value of the property. Only a careful design by experienced engineers can maximize the fuel savings to get this benefit.

Professional Liability Insurance Gives You Peace of Mind

Licensed professional engineering firms like Efficiency Engineering Inc. carry insurance to protect owners against errors and omissions. Although we've never had a claim in 18 years in business, it's there for your protection.