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Property owners: How can you upgrade your building to reduce operating costs?

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As of this year, it's now more than 10% cheaper to install geothermal heating and cooling than a conventional HVAC system. If you need to replace your existing system, there is no debate. If your existing system is more than 10 years old, consider the additional 60% or more annual savings on heating and cooling costs over your present conventional equipment. This will also help you to retain tenants.

If you calculate these saving plus the avoided cost of maintenance, it may pay to renovate now. These tax rebates and incentives, also includes the cost of new ducts and air handlers. This is a very big opportunity. I'm going to explain an affordable method, that will save a 10,000 s/f building owner 74% on fuel and energy by spending only $81,000.

Start with the 30% unlimited Federal Tax Credit for Geothermal HVAC installations.

This is about $2,800 savings per ton of equipment. A high efficiency geothermal HVAC costs about $9,000 per ton for a complete system, and $5,000 if you re-use your existing ductwork.

Next, use the Connecticut Clean Energy Funds $1,200 per ton rebate, approximately 14% off the cost per ton of geothermal HVAC for profit commercial /industrial building (22% for non-profit or municipal buildings.) Adding the fed's 30% plus 14% = 44% first cost savings.

As each building is unique, the combined savings from energy conservation measures will range from 30% to 90%. Geothermal or conventional HVAC equipment and ducts installed in under-insulated buildings, uninsulated attics and basements are sized at least 30% larger than if the building was well insulated. In other words, insulate, and your new equipment will be downsized and cost 30% less for starters. The load reduction benefit of this insulation allows the re-use of existing ductwork with new geothermal that usually requires larger ducts. This cuts the first cost of geothermal installation by another 33%.

In summary, the insulations savings from downsizing the equipment more than pays for the whole insulation job, plus it cuts the equipment's operating costs by 30% for the life of the building. The Connecticut Energy Efficiency Fund provides substantial rebates for insulation over and above codes as they are calculated on a project basis, they are not reflected in the following example.

A mock example of savings from incentives and insulation using realistic numbers:

Assume a 10,000 s/f building requires one ton of heating per 500 s/f = 20 tons. $9,000 unadjusted first cost per ton X 20 tons of geothermal installed = $180,000. Conservation benefits from insulation improvements drops the 20 tons by 30% to 14 tons. $9,000 per ton minus 33% savings from the re-use of existing ducts = $6,000 cost per ton. $6,000 cost per ton X 14 tons = $84,000 geothermal HVAC installation cost. $84,000 cost X 44% saving from federal and state incentives for commercial/industrial building, or now $3,528 per ton. That leaves a cost of $ 3,360 per ton X 14 tons = $47,040 of remaining cost for geothermal or 74% savings off the original 180,000 cost of

geothermal.

Amortize the $34,000 first cost of super-insulation with $68,000 immediate savings. Without the insulation/conservation savings, the $9,000 per ton geothermal cost is reduced only by the 44% federal and state incentives. This reduces it to $5,040 per ton. $5,040 X 20 tons required, without the load reduction benefit of insulation = $100,800. The insulation avoids six tons more equipment = $30,240 and avoids $37,800 of new ducts.

This totals = $68,000 immediate savings, plus 30% lower annual operating costs coming from the insulation each year. Doesn't it make sense to insulate first?

Add in the energy savings of at least 60% from geothermal equipment efficiency and you get about a 72% annual energy savings from the $100,000 cost from both new insulation and install brand new geothermal equipment in a 10,000 s/f building. For this example, I used averages of costs as well as expected energy savings based on practical experience.

There are many types and methods of both insulation and geothermal systems. To determine the best for the needs of your building and how you use it, it may be wise to select a neutral architect or energy consultant, not installers, to guide you through the process so that you will be happy with the results and even certified LEED for Existing Buildings. Good luck making your building financially sustainable.

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