

EMERGING TECHNOLOGIES SHOWCASE WEBINAR: REVERSE CYCLE CHILLERS FOR DOMESTIC HOT WATER IN MULTIFAMILY BUILDINGS

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Question and Answer Session

Q: Did the facilities you studied, where you found 25% of energy use for domestic hot water, have individual meters for hot water in each living unit?

A: In most cases there were not individual meters for hot water. The study disaggregated the hot water heating by looking at total energy use for summer and winter and using basic mathematics to disaggregate the load.

Q: If the Stream Uptown system was not oversized, would you speculate that efficiencies would be better, worse, or the same?

A: It depends on how you define efficiency. I think the oversize is a problem and another problem were some of the early designs which led to pump recirculating and a lot of extra heat loss. This is being remedied. I'm not sure the oversizing in this case was the number one contributor to the inefficiency, its speculation. There are three initial datasets that correlate to three revisions of the design and the efficiency has gotten significantly better. The data should be available to share at the end of the year. Fixing some of the design issues had more of an impact than the size. The heat pumps will run at the same efficiency. It's just a matter of what the overall system does. As we get better numbers back for actual water use, it will help. The system sizing affects everything including costs and space in the garage. There are a lot of other considerations that factor in.

Q: What do the costs look like?

A: The incremental cost of the system is difficult to get. There is the expense of the heat pump and the storage tanks themselves, compared to typically a gas or electric boiler system, which have the same storage capacity and recirculation, etc. There are other factors including things like the economics of taking up space in the garage which can normally be used for parking which can generate revenue. Other factors include not having to bring gas lines into the building if it's now an all-electric building. It's a little hard to pick apart the exact incremental costs. We included estimates based on what the

developers thought were the incremental costs for the projects. The system at Stream Uptown cost about \$55,000 higher than what a comparable system would cost. It's not simply a matter of replacing a standard water heater with an RCC system. There's a fairly complicated economic study that needs to be done on each building.

Q: What is the difference between reverse cycle chiller and heat pump water heater?

A: It's just in the size of equipment. If it operates in the 10, 15 or 20-ton range, it's typically just called a Reverse Cycle Chiller. The smaller units that we install in residences are air to water heat pumps but we call them heat pumps. It's a fancier name for a bigger scale of the same technology.

Q: How do these compete with gas water heating?

A: Concerning the economics, it depends on the price of gas. We think that this is a higher efficiency system. We don't know if Ecotope has done numbers on that. When the developers did basic economics on the system, besides being efficient, electric prices in Seattle will stay stable for a long time. They have something that's efficient and they can predict what they'll be spending for a long time.