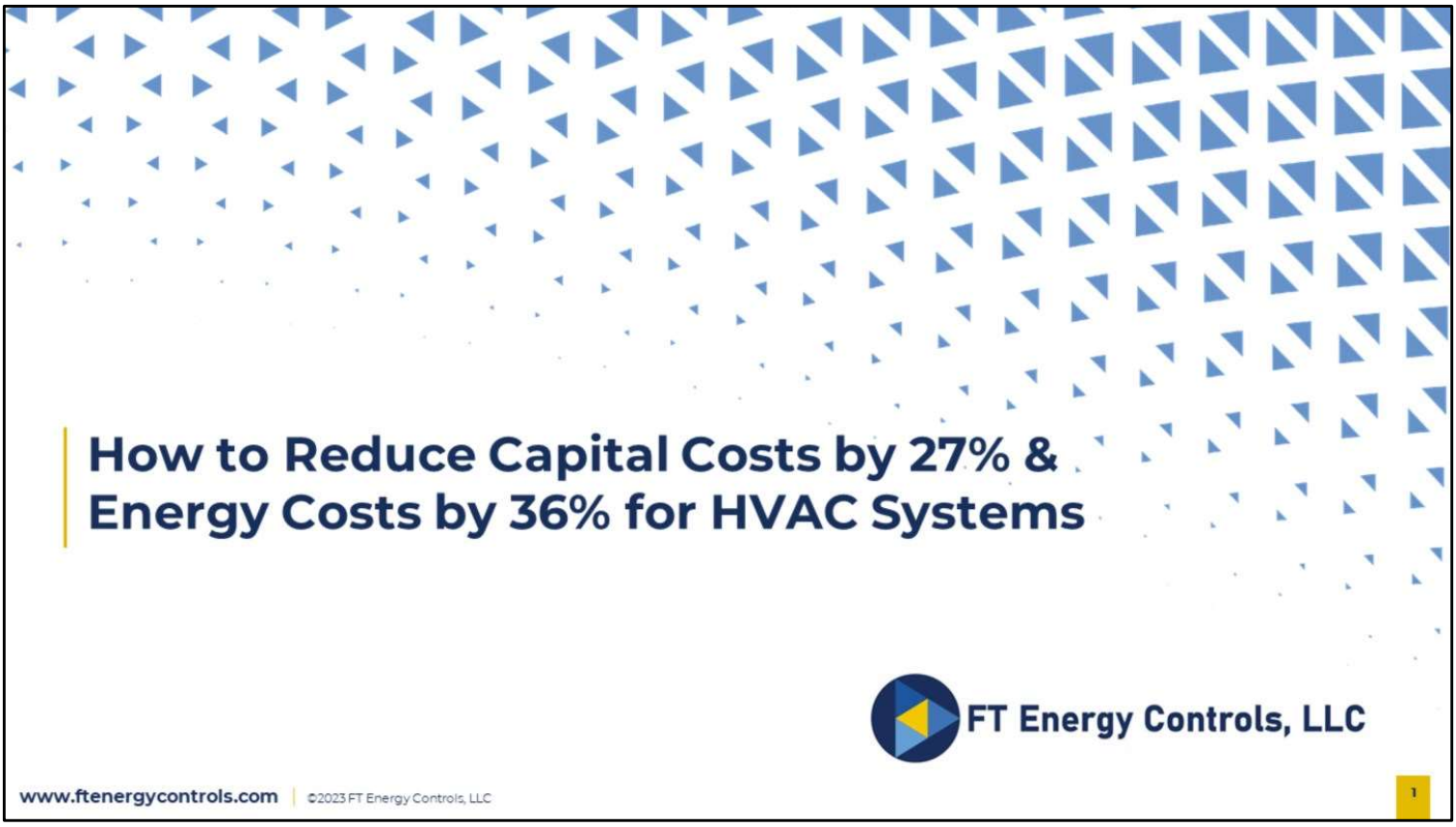
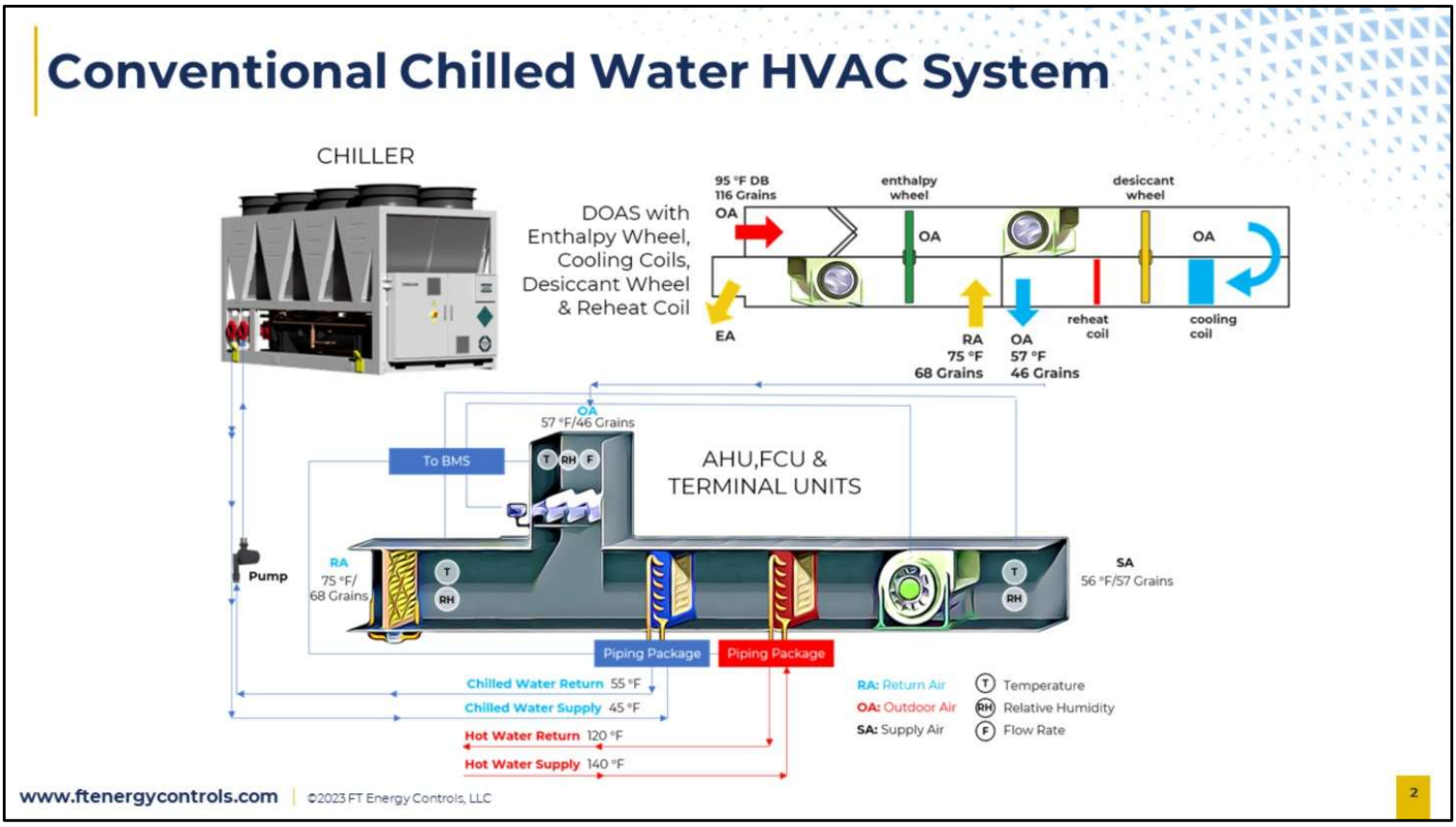


Slide 1 - How to Reduce Capital & Energy Costs for HVAC Systems

My name is Richard Furman and I am the CEO of FT Energy Controls. I have a Masters Degree in Chemical Engineering from MIT and have worked my entire career taking new energy technologies from the laboratory to commercial products. Zachary Thomas is the COO of FT Energy Technologies. Zachary has a PhD in Electrical Engineering from MIT and is also a patent attorney.

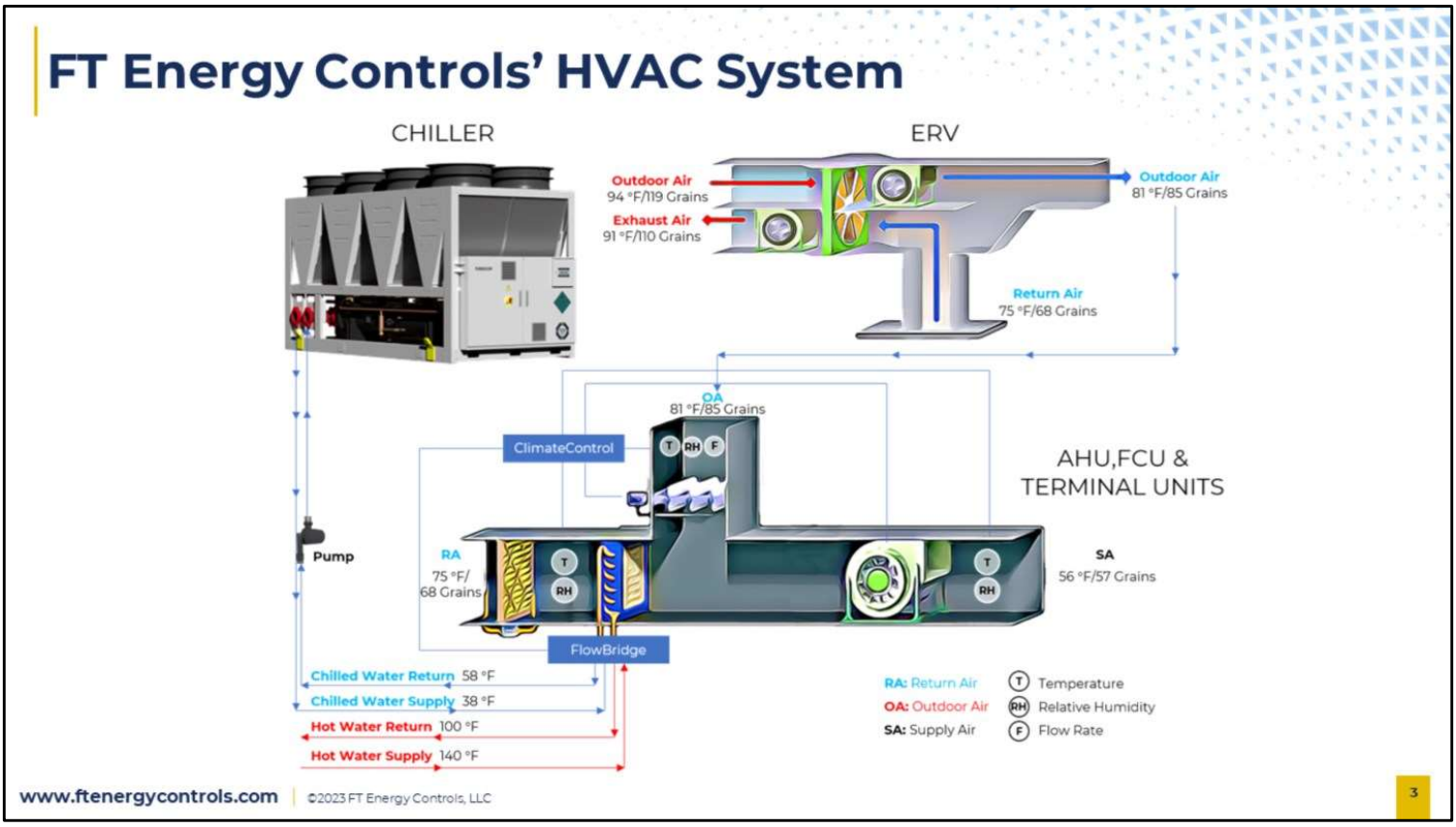
I am excited to be presenting a new chilled water HVAC system that can reduce capital costs by 27% and reduce energy costs by 36%.

This new HVAC system makes use of the recent energy improvements in HVAC equipment in combination with our new control systems that control the chilled water and all of the air properties supplied to every room.



Slide 2 - Conventional Chilled Water HVAC System

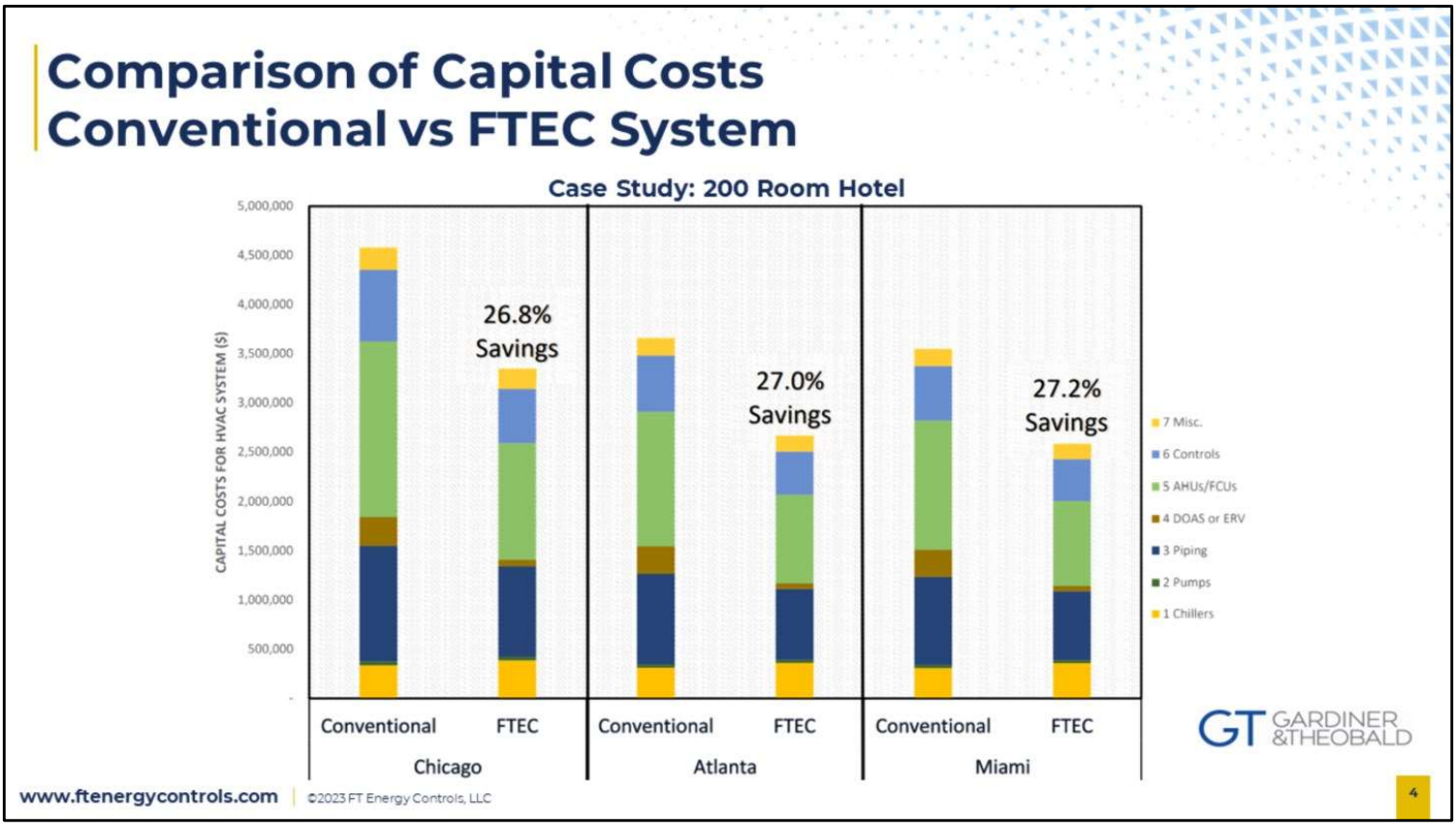
The conventional chilled water HVAC system consists of chillers that provide 45 F chilled water, DOAS that provide 45 F dewpoint air and FCUs that are designed for a 10F delta T across the cooling coils.



Slide 3: FT Energy Controls' HVAC System

FT Energy Controls' HVAC System consists of chillers that provide 38 F chilled water, ERVs that provide conditioned outdoor air and FCUs that are designed for a 20 F delta T across the cooling coils.

Our control system continuously determines the amounts of outdoor air, the amount of moisture removal and temperature reduction needed for each room. The FlowBridge with ClimateControl allows for a 50% reduction in piping and pumping and an 80% reduction in outdoor air equipment costs.



Slide 4: Comparison of Capital Costs for Conventional versus FTEC HVAC Systems

Gardiner & Theobald were hired as an expert cost estimating firm to determine the capital costs for a 200 room hotel in the 3 cities of Chicago, Atlanta and Miami to cover different climate conditions.

This chart shows that there is a 27% capital cost savings for the FTEC system. The chillers are slightly more expensive for the FTEC system but the pumping, piping, ERV, FCUs and controls are all less for the FTEC system.

Comparison of Capital Costs
Conventional vs FTEC System

Case Study: 200 Room Hotel

		Chicago			Atlanta			Miami		
Section	Item	Conventional	FTEC	Variance	Conventional	FTEC	Variance	Conventional	FTEC	Variance
1	Chillers	336,200	386,200	(50,000)	311,600	361,600	(50,000)	308,300	358,300	(50,000)
2	Pumps	39,100	37,100	2,000	32,700	30,700	2,000	31,900	29,900	2,000
3	Piping	1,177,000	921,800	255,200	923,000	722,900	200,100	896,200	701,900	194,300
4	DOAS or ERV	293,200	65,600	227,600	278,800	55,000	223,800	276,900	53,500	223,400
5	AHUs/FCUs	1,778,300	1,179,700	598,600	1,362,400	901,100	461,300	1,306,800	862,900	443,900
6	Controls	728,200	$552,200	176,000	571,000	433,000	138,000	554,500	420,500	134,000
7	Misc.	228,800	211,200	17,600	179,400	165,600	13,800	174,200	157,500	16,700
	Sub-Total	**4,580,800**	**3,353,800**	**1,227,000**	**3,658,900**	**2,669,900**	**989,000**	**3,548,800**	**2,584,500**	**964,300**
8	Project Contingency (10%)	458,080	335,380	122,700	365,890	266,990	98,900	354,880	258,450	96,430
9	Escalation	Excluded	Excluded	Excluded	Excluded	Excluded	Excluded	Excluded	Excluded	Excluded
	TOTAL	**5,038,880**	**3,689,180**	**1,349,700**	**4,024,790**	**2,936,890**	**1,087,900**	**3,903,680**	**2,842,950**	**1,060,730**
10	**% SAVINGS**		**26.8%**			**27.0%**			**27.2%**	

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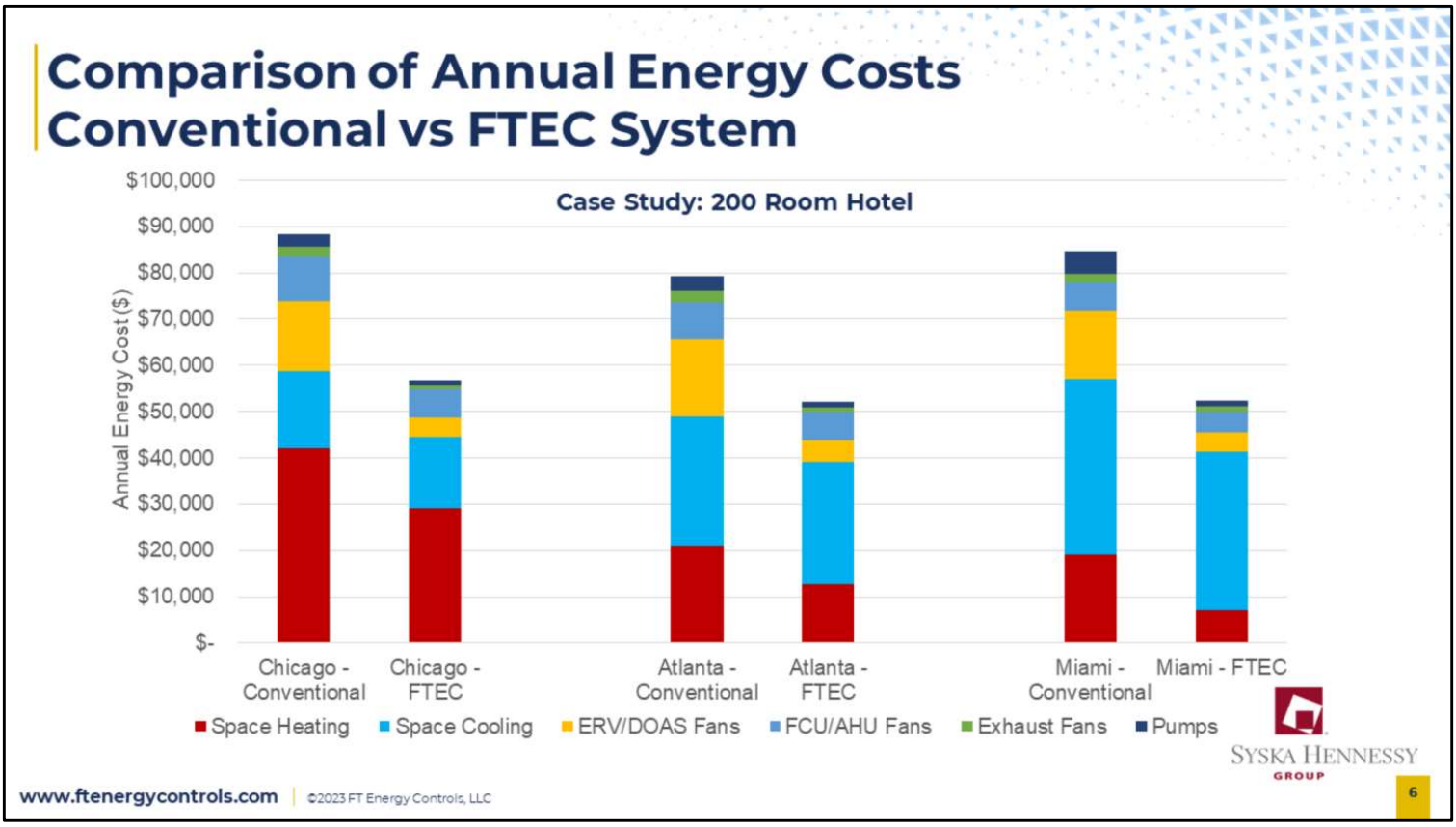
Slide 5: Comparison of Capital Costs for Conventional versus FTEC Systems
This slide shows the actual values that were used to produce the previous slide.



Slide 6: Comparison of Energy Consumption for Conventional versus FTEC HVAC Systems

Syska & Hennessy were hired as an expert energy modeling firm to determine the energy use for a 200 room hotel in the 3 cities of Chicago, Atlanta and Miami. This chart shows that there are energy cost savings of 34% to 38% for the FTEC system for these 3 cities. The energy consumption for cooling, heating, all of the fans and pumps are less for the FTEC system.

Annual Energy Use Savings Summary

Case Study: 200 Room Hotel

Natural Gas							
	Utility Rates ($/therm)	Conventional (therms)	Cost	FTEC (therms)	Cost	Percent Savings	Annual Savings
Chicago	0.941	44,691	$42,054	31,002	$29,172	31%	$12,882
Atlanta	0.888	23,672	$21,021	14,251	$12,654	40%	$8,366
Miami	1.25	15,347	$19,183	10,143	$12,678	34%	$6,505

Electricity							
	Utility Rates ($/kwh)	Conventional (kwh)	Cost	FTEC (kwh)	Cost	Percent Savings	Annual Savings
Chicago	0.1142	406,490	$46,421	242,495	$27,692.90	40%	$18,728
Atlanta	0.1257	467,311	$58,741	314,579	$39,542.64	33%	$19,198
Miami	0.1103	592,753	$65,380	410,567	$45,285.55	31%	$20,095

SYSKA HENNESSY GROUP

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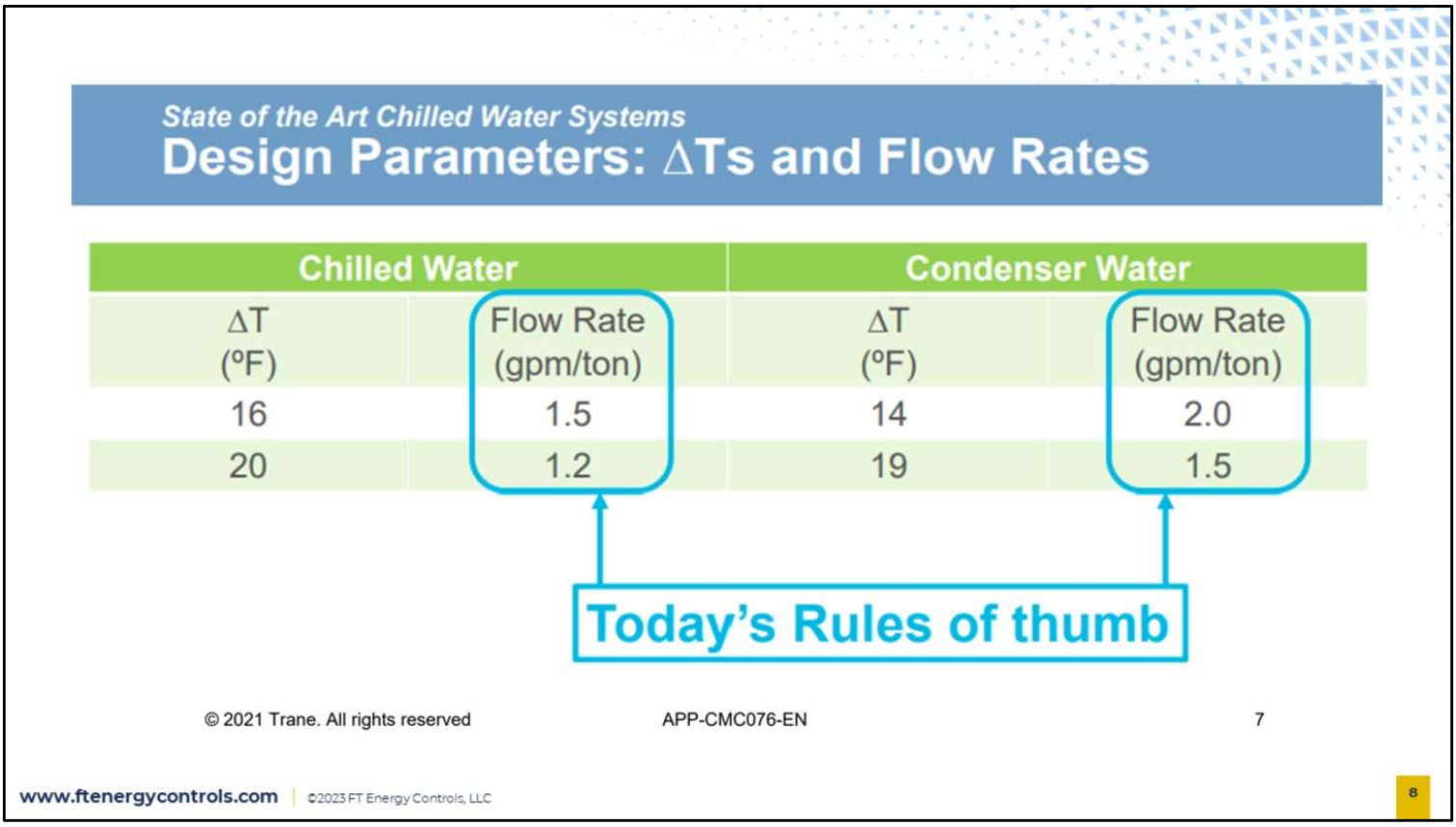
Slide 7: Annual Energy Cost Savings for Conventional versus FTEC HVAC Systems

This chart shows that there are natural gas cost savings of 31% to 40% for the FTEC system for these 3 cities.

This chart also shows that there are electricity cost savings of 31% to 40% for the FTEC system for these 3 cities.

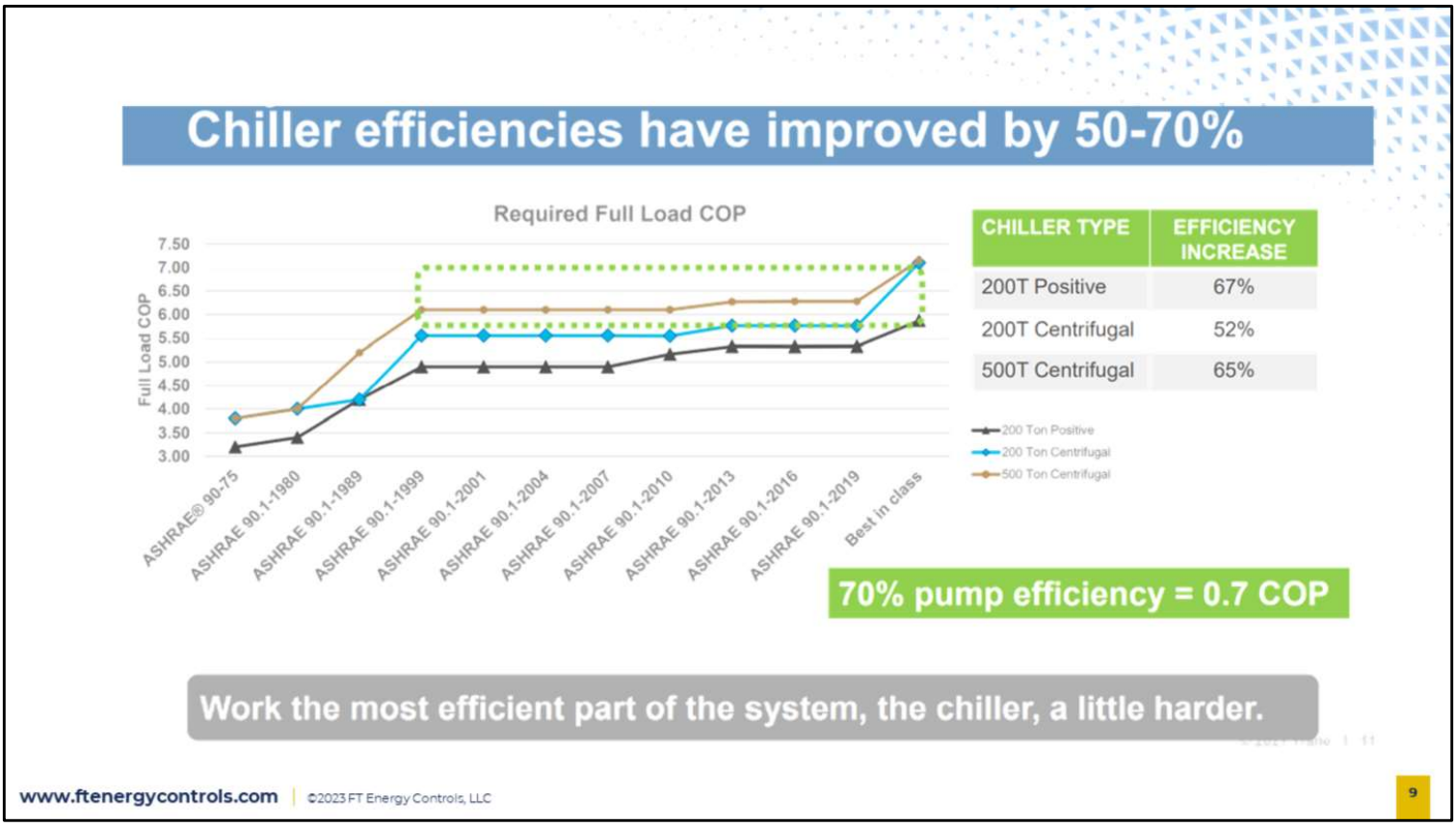


Slide 8: Design Parameters: Delta Ts and Flow Rates

It is important to understand how the demands on HVAC Systems have changed and what technological advancements have been made to help satisfy those demands.

Ten years ago, all you needed was a Chiller to provide a 10 F Delta T to the cooling coils in the Air Handling Units and Fan Coil Units in the building.

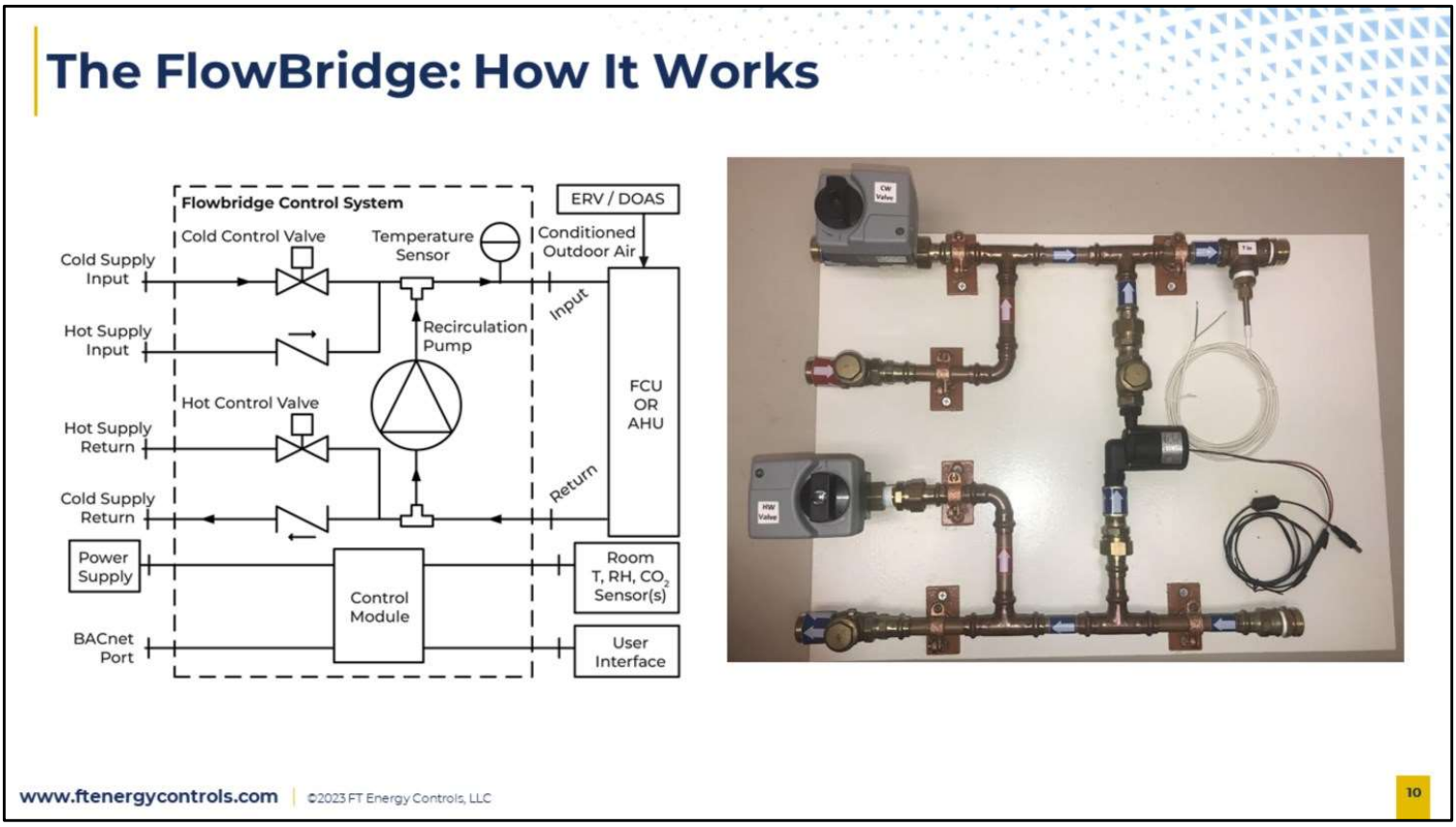
Today ASHRAE requires a 15 to 20 F Delta T that reduces the flow rate of chilled water which reduces the pumping energy costs and the piping costs.



Slide 9: Chiller Efficiencies have Improved by 50 to 70%

ASHRAE recommends a minimum Delta T of 15 F with colder temperature chilled water of 42 F from the chillers and 57 F return from the cooling coils.

What makes this possible is the fact that the efficiencies of chillers have improved significantly while the efficiencies of the pumps have only increased slightly.



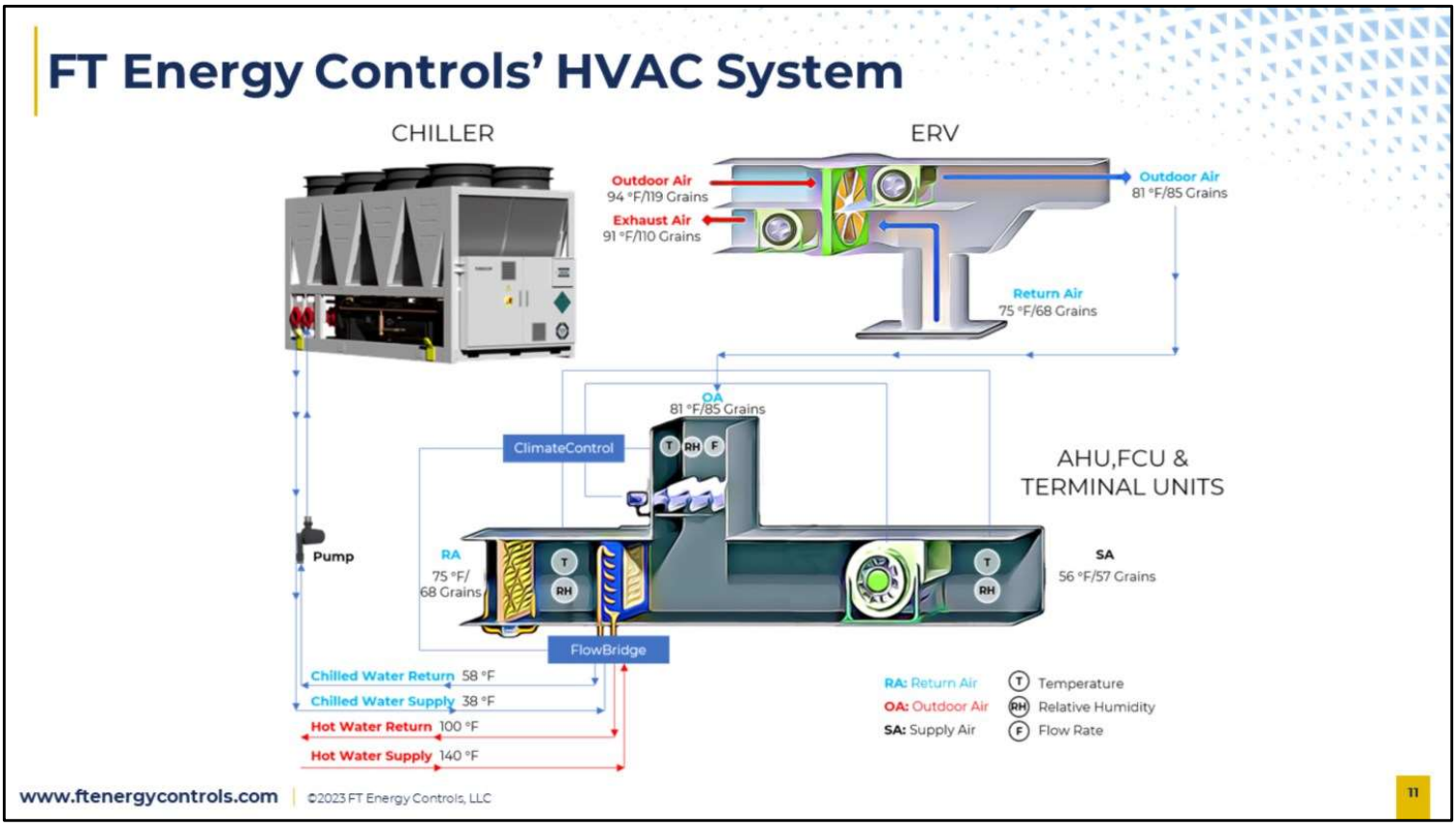
Slide 10: FlowBridge: How It Works

ASHRAE Standard 90.1 – 2016 - 6.5.4.7 Chilled Water Coil Selection - Chilled-water cooling coils shall be selected to provide a 15 F or higher temperature differential… Exceptions: 2. Individual fan-cooling units with a design supply airflow rate less than 5000 CFM are exempted.

The reason for this exemption is the additional cost and complexity of being able to provide a high delta T for units less than 5000 CFM. The FlowBridge overcomes these costs and complexity by making it possible for higher delta Ts with FCU and AHU of any size.

This slide shows the FlowBridge which is a low-cost piping package consisting of a chilled water control valve, a hot water control valve and a recirculation pump which enables the mixing of warmer return water from the FCU to be mixed with colder chilled water to adjust the inlet water temperature to the coil. Unlike a conventional FCU which are supplied a constant 45 F chilled water, the FlowBridge supplies different temperatures of chilled water to each room depending upon the amounts of moisture removal and temperature reduction that is needed in each room.

The FlowBridge controls the chilled water by providing a fairly constant flow rate, for maximum heat transfer, and variable temperature, for controlling the SHR (Sensible Heat Ratio).



Slide 11: How FTEC's HVAC System Works

If we make use of 38 F chilled water, we are able to condense more moisture from the air in the AHU and FCU and reduce the moisture removal needs from the DOAS or ERV.

Another technological advancement is the development of high efficiency, enthalpy wheels which can exchange both moisture and temperature between the conditioned air being exhausted for the building and the outdoor air being added to the building.

As this diagram shows, a high efficiency, enthalpy wheel can make use of the 75 F air with only 68 grains of moisture to reduce the outdoor air from 94 F and 119 grains of moisture to 81 F and 85 grains of moisture before being introduced into the AHU and FC. This provides 2/3rds of the temperature reduction and 2/3rds of the moisture removal needed to get to the room neutral conditions of 75 F and about 50% RH. This eliminates the need for the more expensive DOAS which include cooling coils, reheat coils and sometimes desiccant wheels in addition to the enthalpy wheels to remove more moisture from the outdoor air.

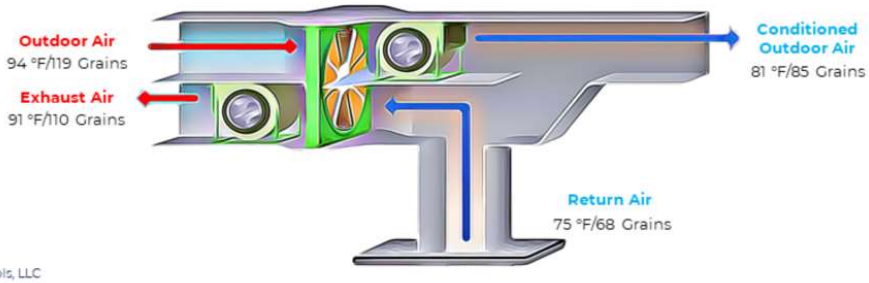
The Type of DOAS or ERV to use with HVAC Control Systems

The following are the different types of ERV and DOAS units that can be used and their relative costs:

ERV or DOAS	Equipment Needed	Relative Equipment Costs
ERV	Enthalpy Wheel	$4/CFM
DOAS with DX Cooling Coil	Enthalpy Wheel & DX Cooling Coil	$20/CFM
DOAS, CW Cooling Coil & Desiccant Wheel	Enthalpy Wheel, CW Cooling Coil & Desiccant Wheel	$24/CFM

FTECs control system can make use of an ERV which will reduce both the capital and energy cost of the HVAC system.

Typical Energy Recovery Ventilator with only Enthalpy Wheel Summer Operation



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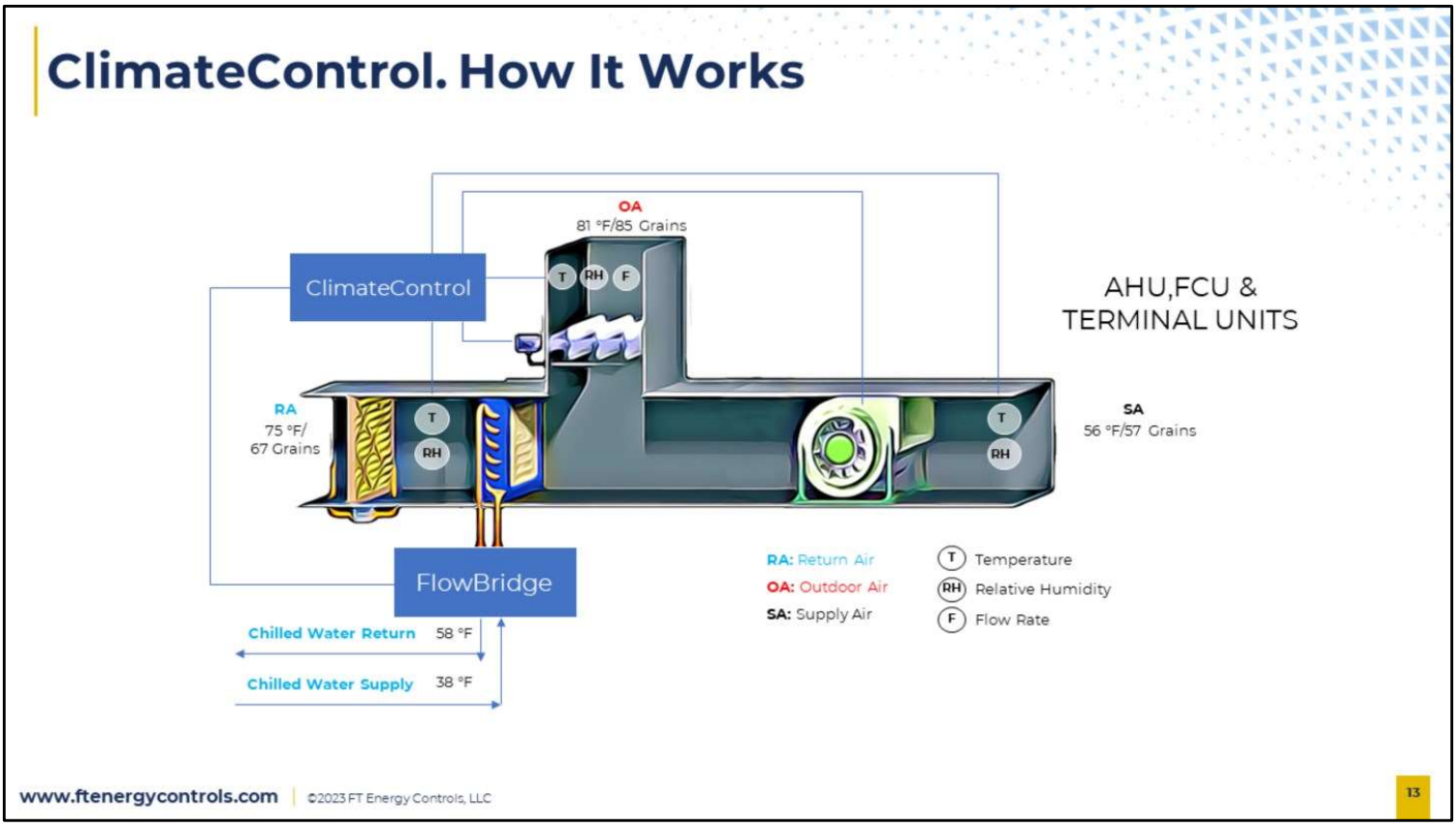
Slide 12: The Differences Between an ERV and a DOAS and their Comparative Costs

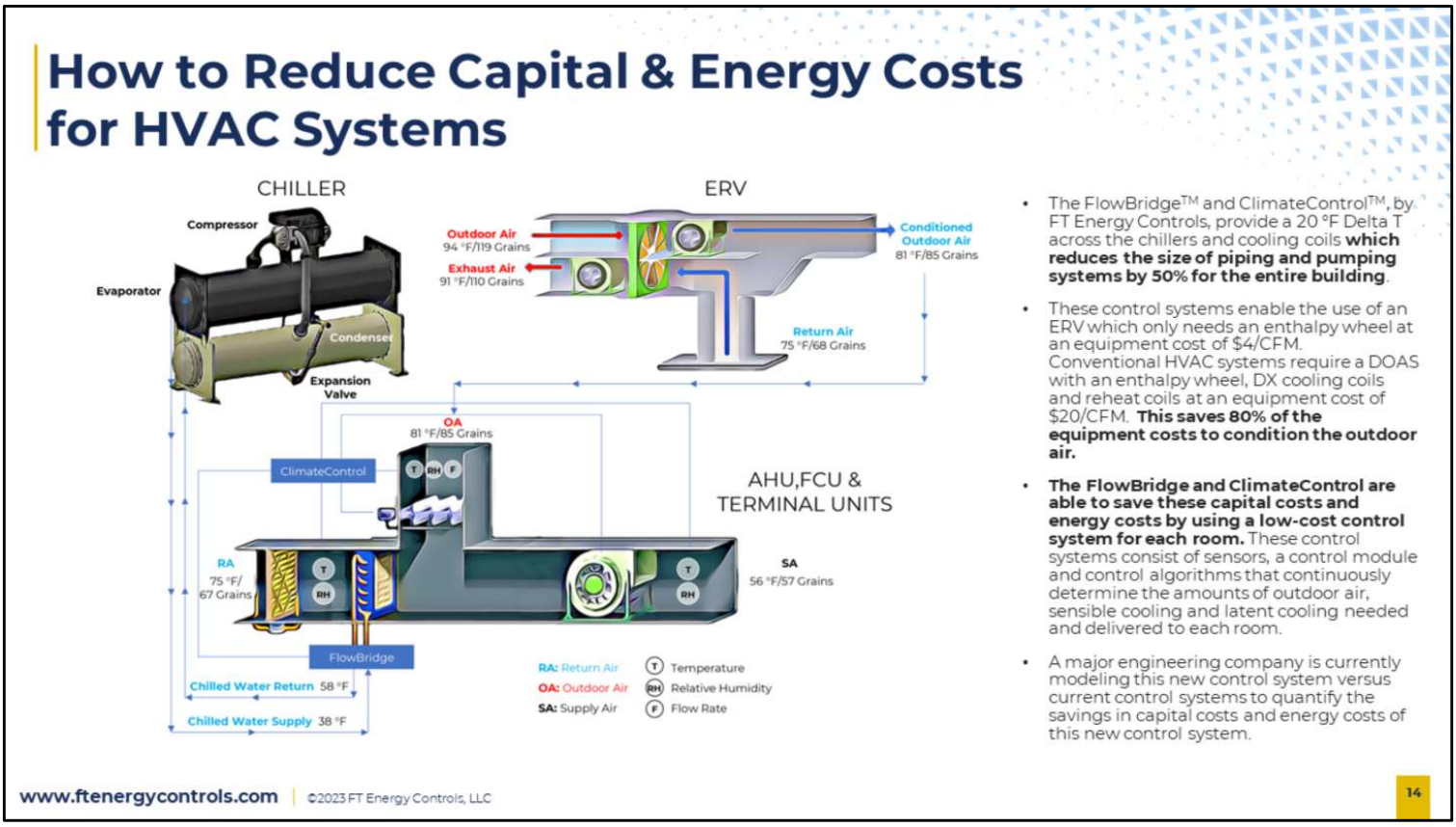
This slide shows the different types of DOAS and ERVs that can be used and their equipment costs.
The 3 options are:
An ERV with an enthalpy wheel at an equipment cost of $4/CFM of capacity.
A DOAS with an enthalpy wheel and DX Cooling Coils at an equipment cost of $20/CFM of capacity.
A DOAS with an enthalpy wheel, chilled water, cooling coils and a desiccant wheel at an equipment cost of $24/CFM of capacity.

FT Energy Controls' system can eliminate 80% of the equipment cost for the conditioning of outdoor air by using an ERV rather than a DOAS.



Slide 13: ClimateControl: How It Works

This slide shows a typical AHU or FCU with both the FlowBridge and ClimateControl to measure and control the water side and the air side respectively. ClimateControl uses sensors to measure the Temperatures Relative Humidities and CO2 of the RA, OA and SA, and the flowrate of the OA. By using these low cost, sensor measurements, together with energy and material balances, it calculates and controls the amounts of outdoor air, moisture removal and temperature reduction needed in each room.



Slide 14 – How to Reduce Capital & Energy Costs for HVAC Systems

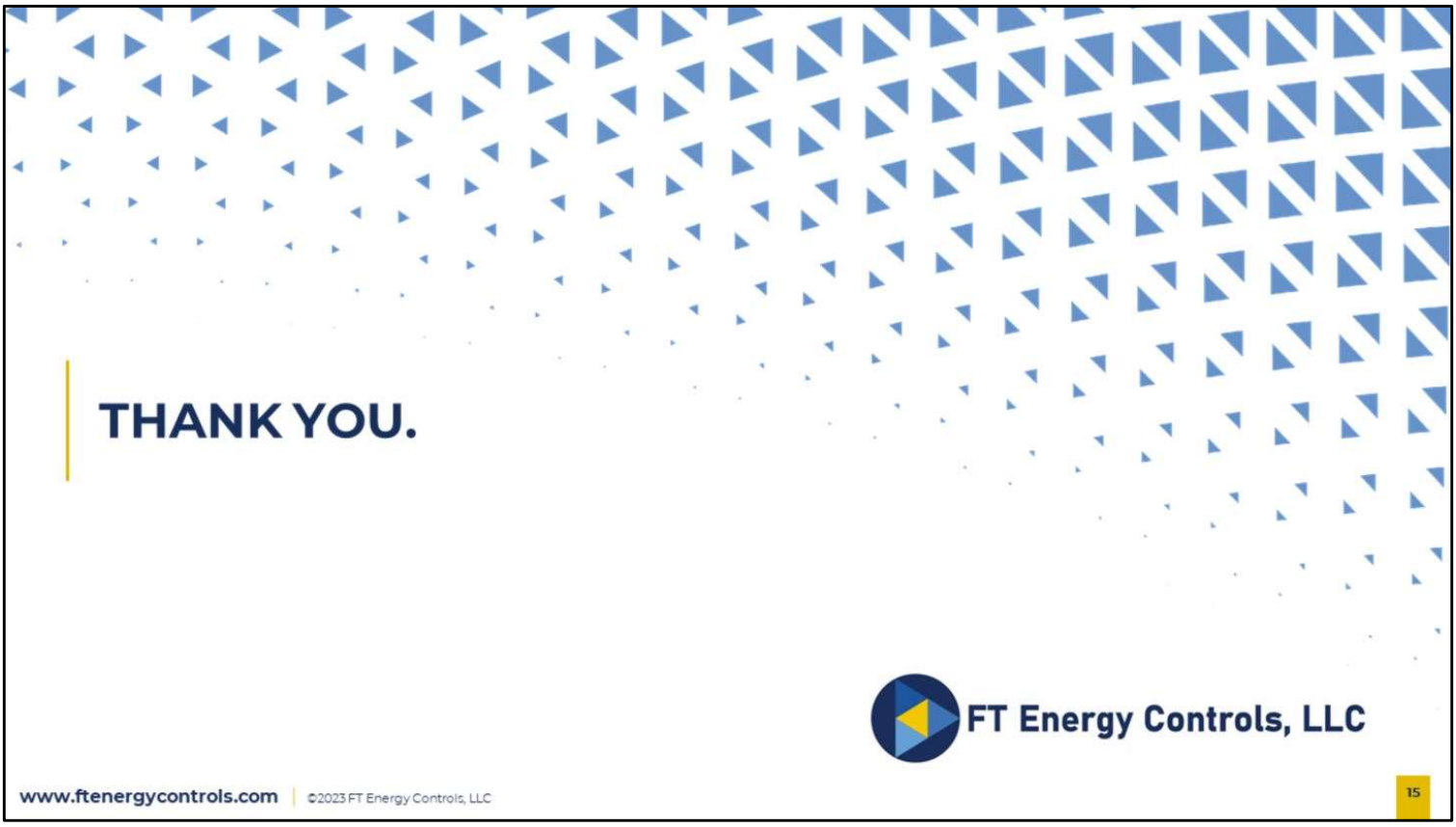
In summary, FT Energy Controls' FlowBridge and ClimateControl:

Reduces the size of piping and pumping by 50% for the entire building;

Saves 80% of the equipment costs to condition the outdoor air; and

Makes use of a low-cost control system for each room which provides the required amounts of outdoor air, moisture removal and temperature control.

By using a single coil for both cooling and heating, FTEC's system reduces both the capital costs and the energy costs for the FCU and the piping packages.



Slide 15 – Thank You

Please visit our website for additional information: FTEnergyControls.com