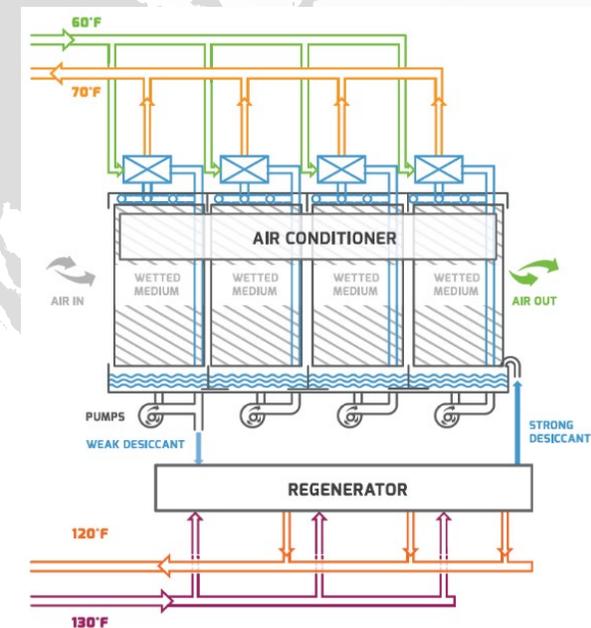
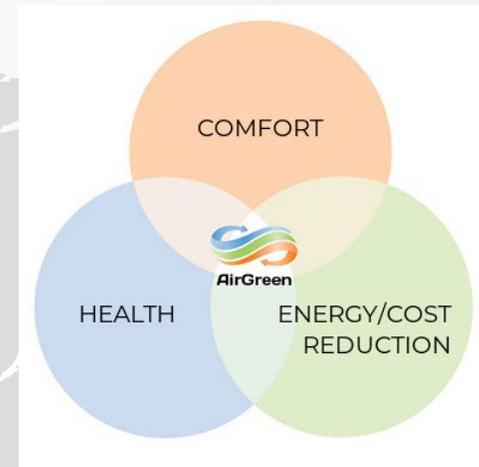


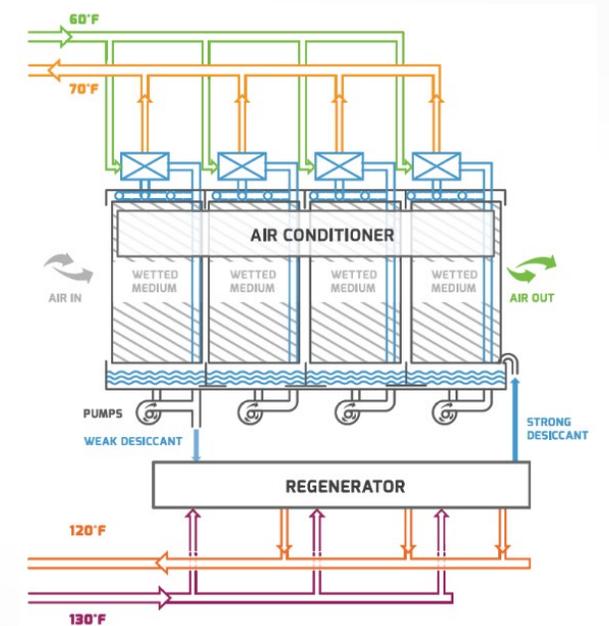
AIRGREEN INC.

Presentation for Delaware Energy Conference
October 24, 2019
John Hammond – CEO, AirGreen Inc.



TOPICS

- Trends in Global Air Conditioning
- The Global Cooling Prize
- AirGreen Technologies
- Installations and Projects
- Performance Data
- Conclusions



TRENDS IN GLOBAL AIR CONDITIONING

- Developing countries, which consumed less than half the world's energy in 2000, now account for 58%, and will grow to 67% by 2040 (International Energy Agency).
- Electricity consumption from air conditioning in India is expected to **grow 30X** from 2010 to 2030 if energy efficiency is not improved.
- If only incremental efficiency changes are implemented, air conditioning will account for 40% of the global growth in energy consumed in buildings by 2050 – an amount of energy equal to all of the electricity used today in the U.S. and Germany combined.
- This is in large part driven by the expansion of the middle class. In China, homes with air conditioning in many urban areas went from approximately zero to nearly 100% (Wall St. Journal).
- Peak-time demand for A/C in these emerging markets also provides a considerable power generation investment challenge.



THE WALL STREET JOURNAL Can India Afford to Cool Down?

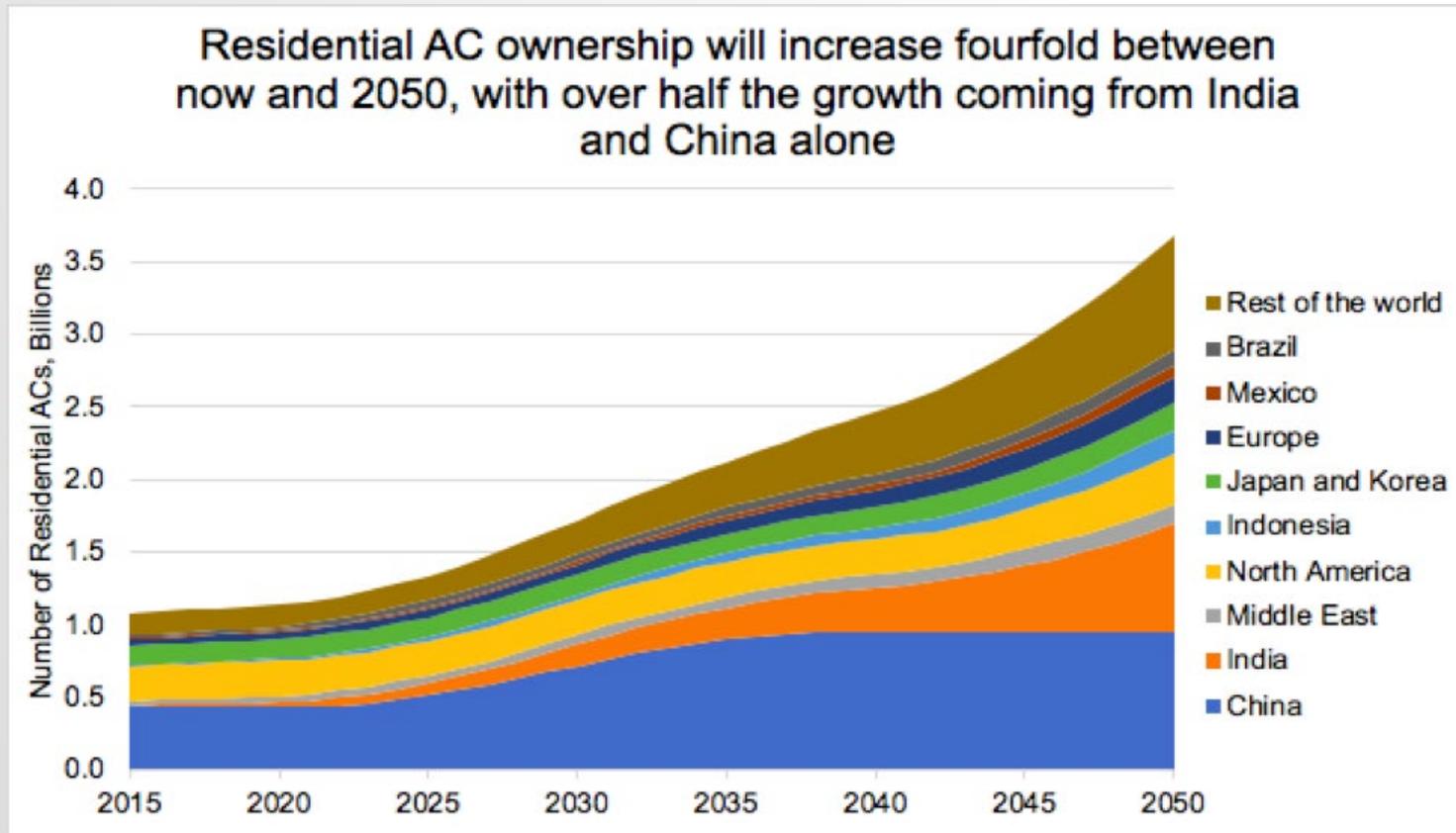
The world's fastest-growing market for air conditioners sparks a search for solutions that could help all developing countries.



Building fronts such as this one in Mumbai, seen in 2012, demonstrate the growing profusion of conditioning units in India. PHOTO: GETTY IMAGES

THE AC INDUSTRY CONUNDRUM: COOLING IS WARMING THE PLANET, BUT MARKET FAILURES ARE PREVENTING THE AC INDUSTRY FROM INNOVATING

- The number of total residential air conditioners in the world is forecast increase from ~900 million to about 3.7 billion by 2050. With current technology and efficiencies, global residential cooling may offset many of the efforts to date to battle climate change.



- Emerging economies in the tropics and the subtropics, such as India, China, Brazil, and Indonesia, are expected to see a fivefold increase in demand for cooling in the next three decades.

Total number of operating residential ACs, billions. Chart Source: RMI graph based on figures from IEA, "The future of cooling," 2018.

RMI GLOBAL COOLING PRIZE

- ❖ The Global Cooling Prize is rallying a global coalition of leaders to solve the critical climate threat that comes from growing residential air conditioning demand. By harnessing the power of innovation, we can provide cooling solutions that enhance people's lives without contributing to runaway climate change.
- ❖ This groundbreaking competition is designed to develop and scale a residential cooling solution that consumes five times (5x) less grid-supplied energy than today's standard products.
- ❖ This technology could prevent up to 100 gigatons (GT) of CO₂-equivalent emissions by 2050 and prevent 1°C of global warming by 2100, all while improving living standards for people in developing countries around the globe.



- ❖ **AirGreen and TORO have reached an initial agreement (“MOU”) to collaborate on this effort, which could fund up to \$200K in additional research.**
- ❖ Analysis and modeling of **8760 data points** show we can meet the 80% energy savings target within the cost and footprint specs.



RMI GLOBAL COOLING PRIZE

Prize Engagement and Global Diversity

2100+

Registrations
from 96 Countries

445

Intent to Apply Submissions
from 56 Countries

139

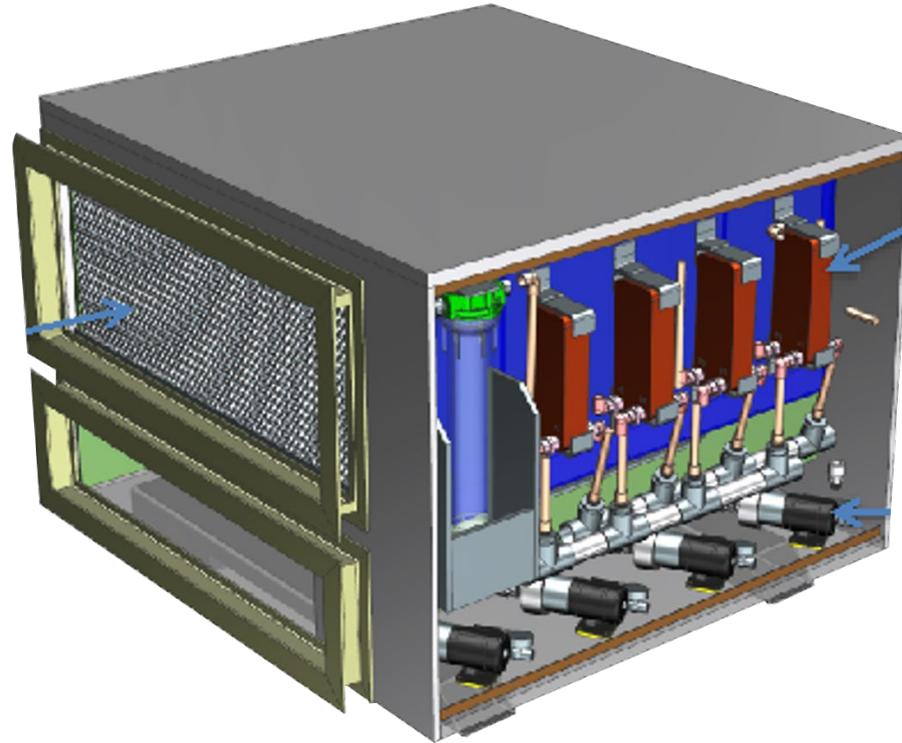
Detailed Technical Applications
from 31 Countries



AIRGREEN PROVIDES COMPLETE AIR CONDITIONING

Our mission is to bring to market the first commercially competitive liquid desiccant humidity control HVAC product

High-performance proprietary pads for humidity removal and air cleaning



Total heat removal with stainless steel brazed plate heat exchangers

Efficient liquid desiccant pumps and liquid filter

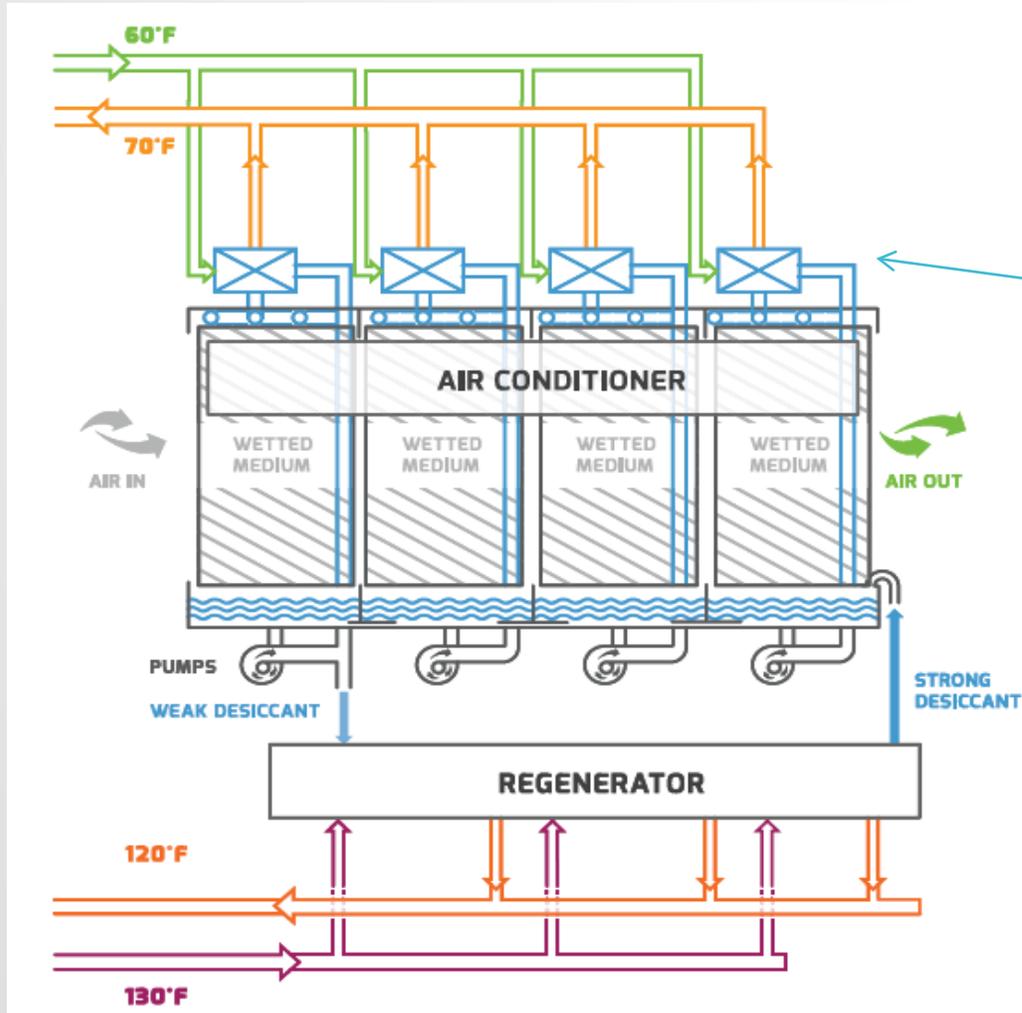
- ❖ Simple
- ❖ Compact
- ❖ Redundant
- ❖ Modular

Multi-stage process for high efficiencies



THE AIRGREEN MULTI-STAGE LIQUID DESICCANT PROCESS

[PATENTED]



Moisture removed on several absorbers by strong liquid desiccant
Liquid desiccant is pumped through plate heat exchangers with cooling fluid to **remove heat** at each stage
Air delivered **dry and cooled**

Exhaust air from the building together with a heat source is used to **reconcentrate the weak desiccant** for reuse (reverse of this process)



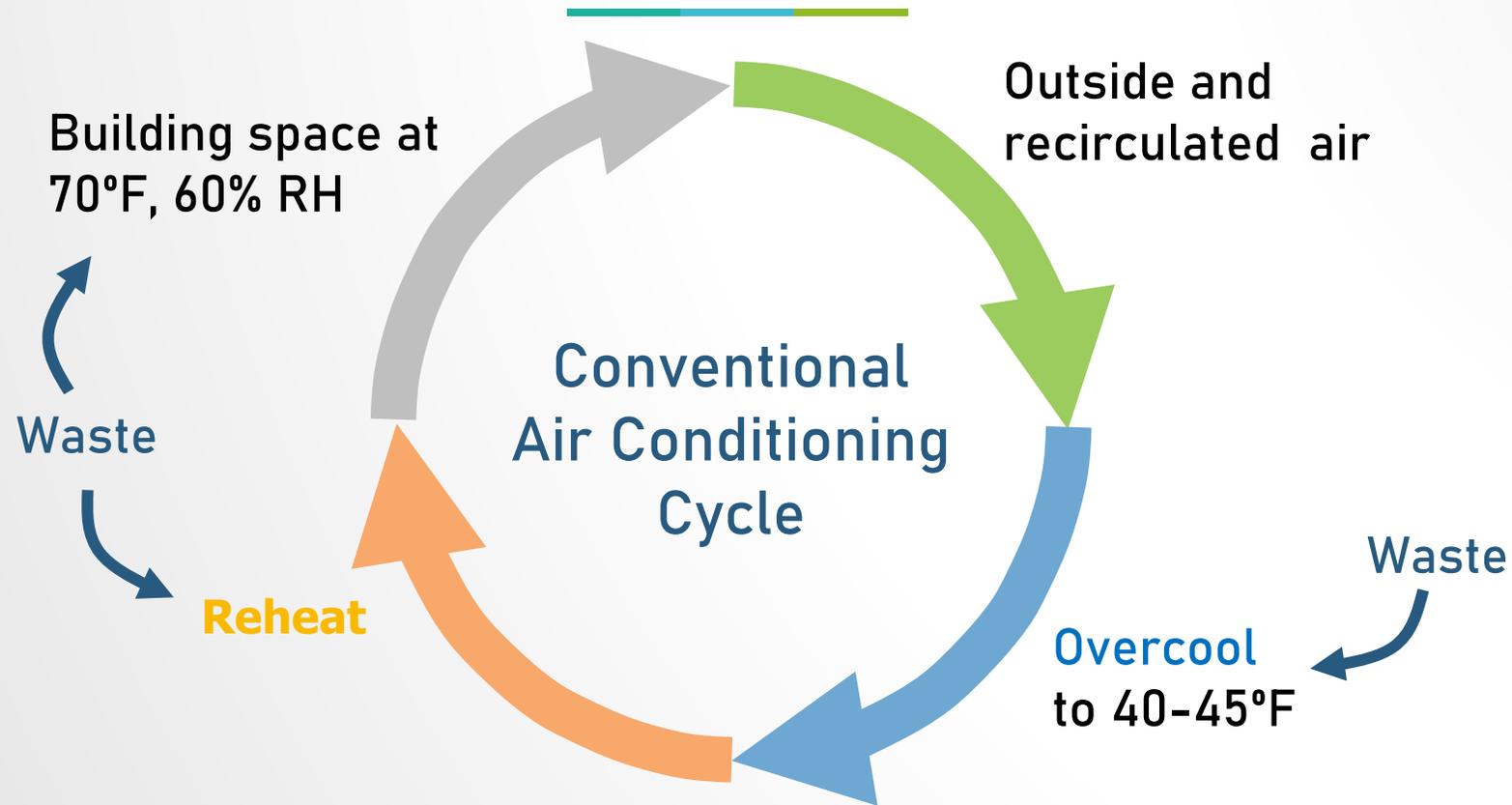
TRENDS IN GLOBAL AIR CONDITIONING



Table 2. Comparison between LDS and VCS ⁽¹⁾

Parameter	Vapor Compression System	Liquid Desiccant System
Indoor Air Quality	Average	Improved
Energy Source	Electricity, Natural Gas	Waste Heat, Solar Energy, or Any Low-Grade Heat
Moisture Removal Capacity	Average	High
Operational Cost	High	Saves 40-50%
Energy Storage Capacity	Low	High
Solutions	HFC, CFC, HCFC	LiCl, LiBr, HCOOK, TEG
Effect on Environment	Harmful	Comparatively eco-friendly
<i>⁽¹⁾ Applied Energy Journal, Volume 111, 2013</i>		

PROBLEM - CONVENTIONAL AIR CONDITIONING WASTES UP TO 60% OF THE ENERGY SEASONALLY



ENERGY IS WASTED IN THREE WAYS



SOLUTION – AIRGREEN EFFICIENCY



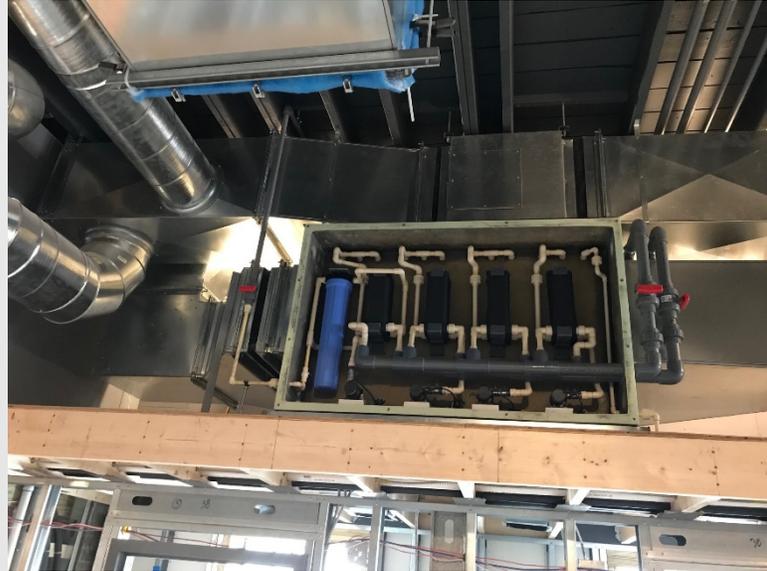
UNLIMITED HUMIDITY REMOVAL
USES SMALLER HEAT PUMPS OR RENEWABLE SOURCES



RECENT AIRGREEN INSTALLATIONS



AirGreen A/C Unit



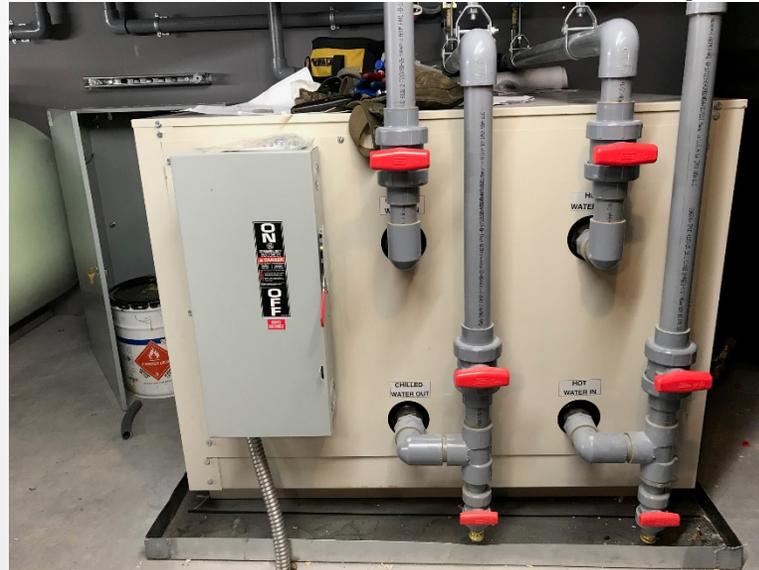
AirGreen Regenerator Close-up



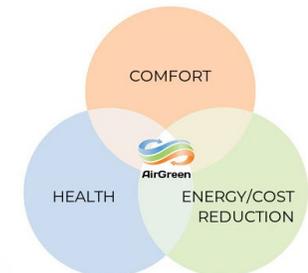
AirGreen Regenerator



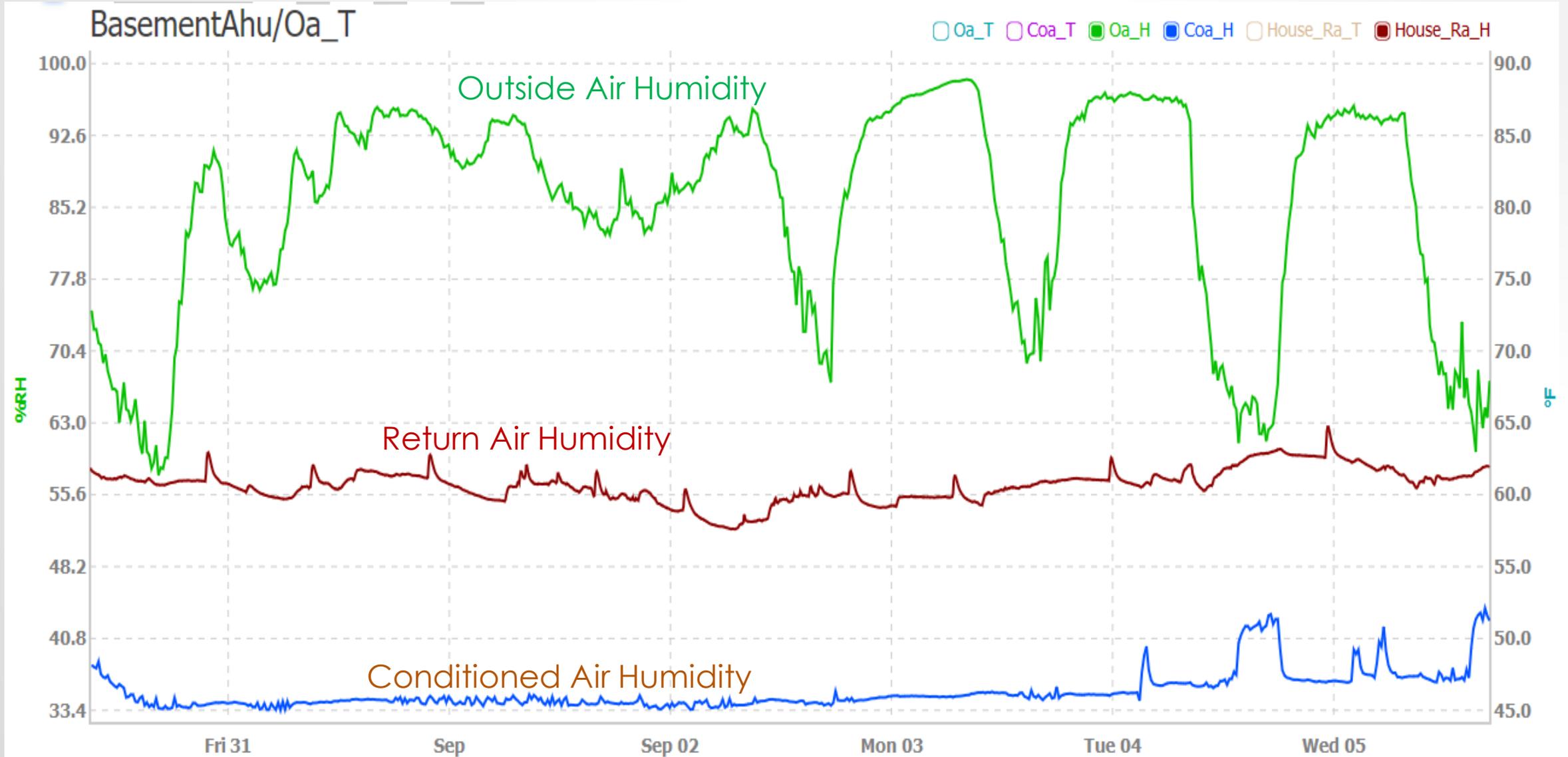
AirGreen MultiStack Heat Pump



- Second Full Installation of AirGreen Technology
- Works in Concert with Standard RTU's
- Will Provide Superior Humidity Control and Energy Savings



Historical Data at Oberod – First Week of Sept 2018 - Humidity



CONCLUSIONS

- Air Conditioning is more important and more global than you might think
- As Sensible Loads decrease, the technology to manage the Latent Load (humidity) is becoming increasingly important
- Effective Latent Cooling can be managed much more efficiently with new technologies
- New applications such as grow houses and other industries that need direct humidity control will demonstrate the efficacy of these technologies
- Hybrid and combined HVAC solutions (i.e. – liquid desiccant system with low-cost evaporative cooling) should also be demonstrated

