

Coolerado Overview
Torreon, April 29 - 2014



Tom J. Teynor
Chief Executive Officer

Coolerado Overview

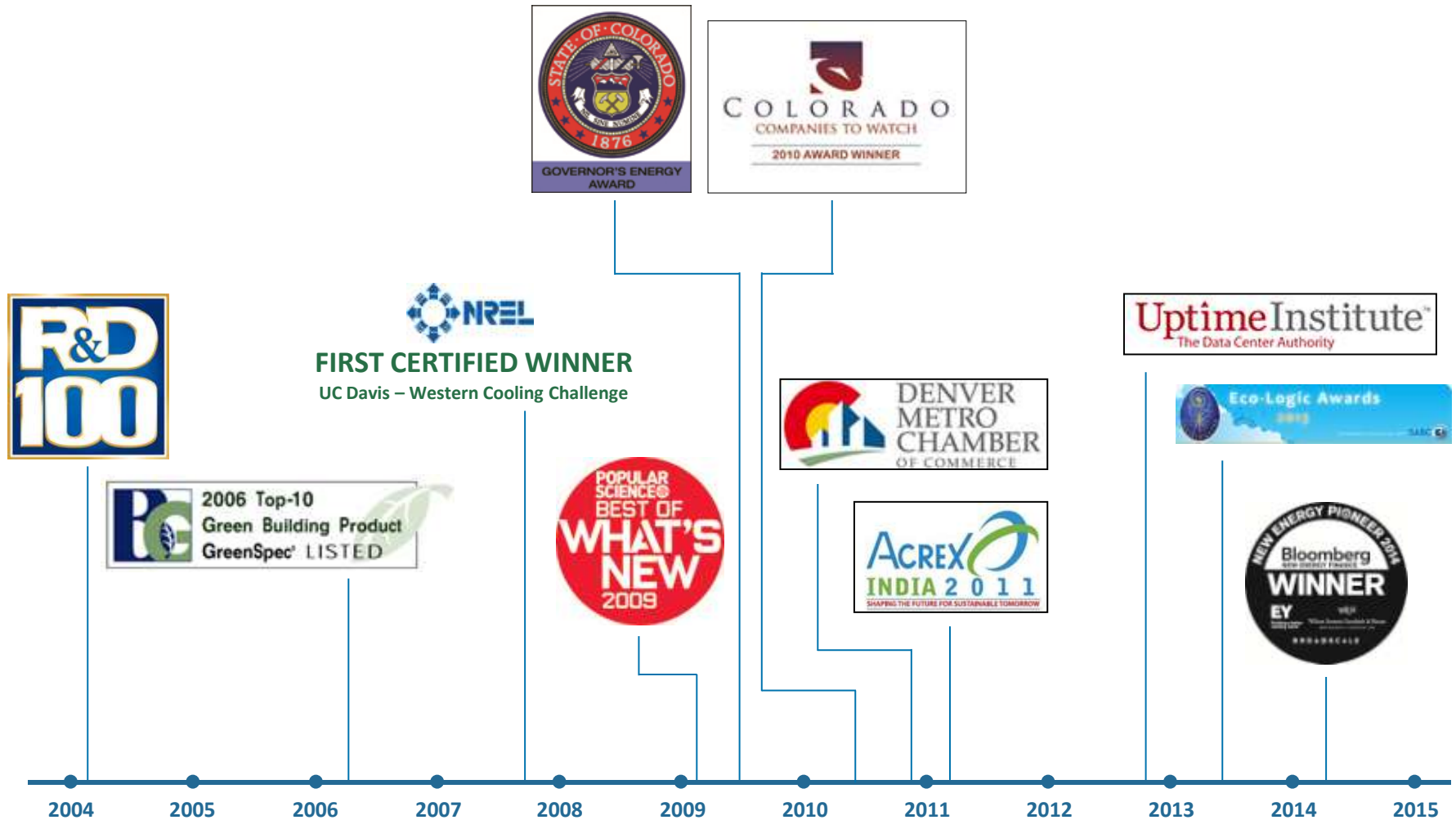
- Founded in 1999 in Denver, CO
- Patented HMX technology uses a unique cooling process – known as the Maisotsenko Cycle
- Capitalized by New World Capital in 2010



Coolerado's patented Heat and Mass Exchanger (HMX)

- Provides exceptional cooling energy savings
- Reduced carbon emissions and 100% fresh air
- Best results with high fresh-air need or high heat-load end users
- No refrigerants, no compressor, no vibration, low maintenance

Coolerado – Accolades and Awards



Don't just take our word for it, our technology has been evaluated by many independent sources

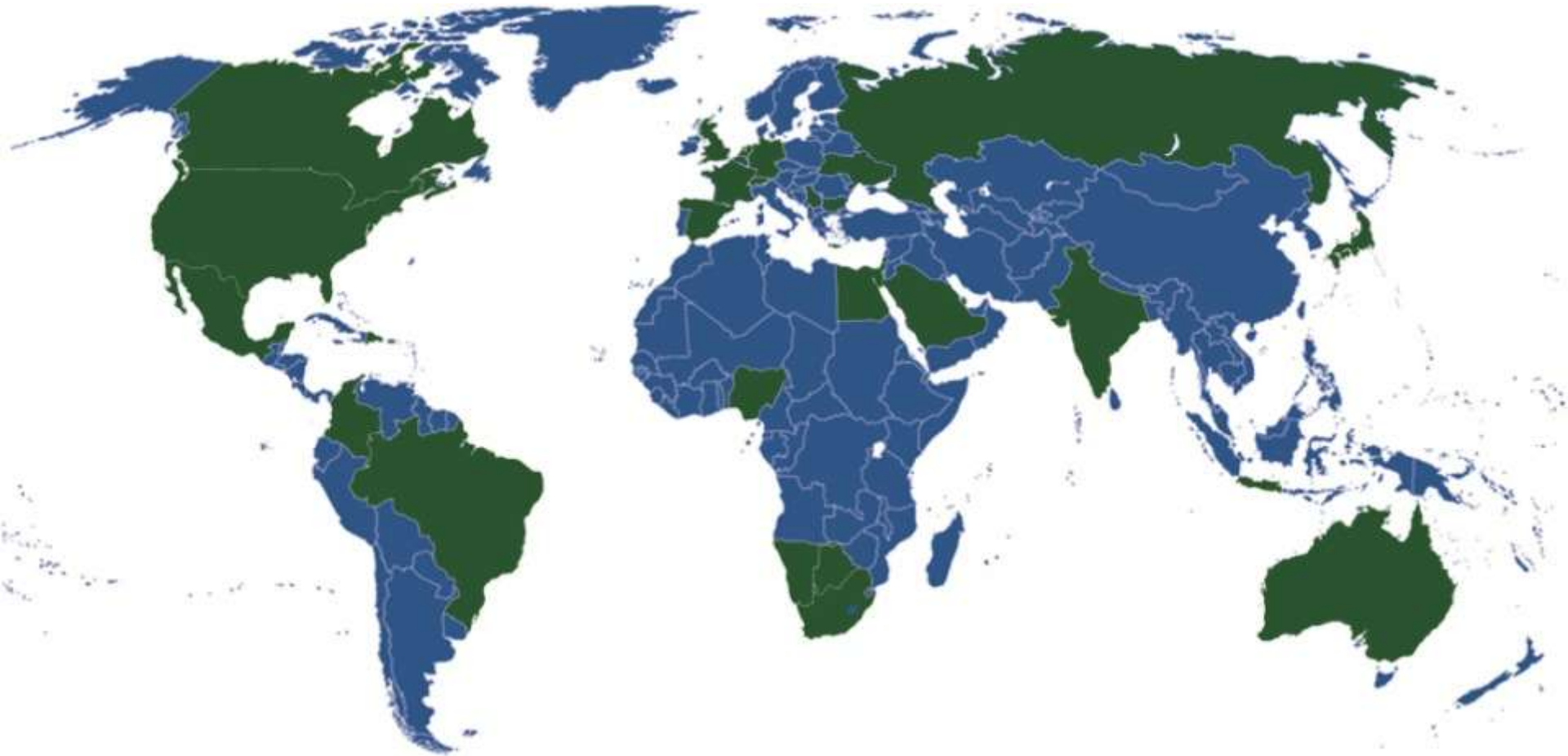
1. Department of Energy
2. National Renewable Energy Lab
3. Sacramento Municipal Utility District
4. Pacific Gas & Electric
5. Federal Energy Management Program
6. Tested by ETL
7. CE Compliant





How Coolerado Efficiently Cools

Proven technology installed in 30 countries



Verticals and Sample Customers

INDUSTRIAL & MFG



DATA CENTERS



HEALTH CARE



RESTAURANTS



MILITARY



COMMERCIAL





Inspired by you



The world's local bank



Why HMX Performance is Special

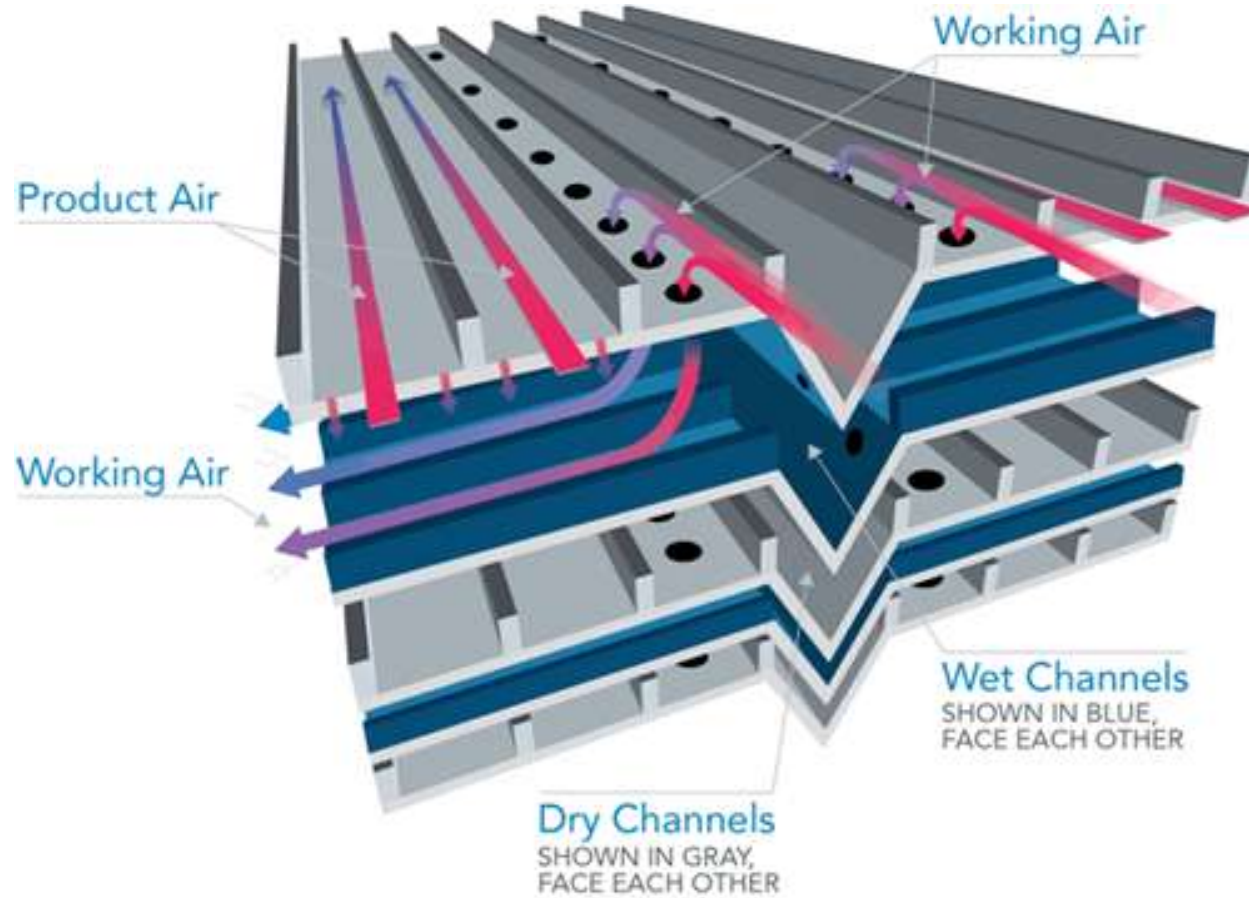
- 120% wet bulb effectiveness (in field – wet bulb +2 F)
- Low pressure drop compared to other evaporative technologies: 0.9 IWC (low fan energy use)
- kW/Ton
 - .3 Comfort Conditioning
 - .1-.25 Data Centers
- Reduction of power infrastructure & natural fit with DC power
- Less water consumption than alternatives



HMX Specifications

- Polypropylene, impregnated with a biocide
- Integrated watering system
- Modular, easy to install cassette
- Class 2, UL 900, smoke and fire rating
- 18 x 20 x 10.5" contains ~ ½ mile of channels

Coolerado's HMX



Modular HMX Flexibility and Scalability

A GUIDELINE OF HMX PER CFM NEEDS

Supply CFM	6,500	15,000	20,000	30,000	65,000
Coolerado HMXs	24	56	74	111	240
Available Components	DX / Heating	DX / Heating	DX / Heating / Energy Recovery	DX / Heating / Energy Recovery	DX / Heating / Energy Recovery

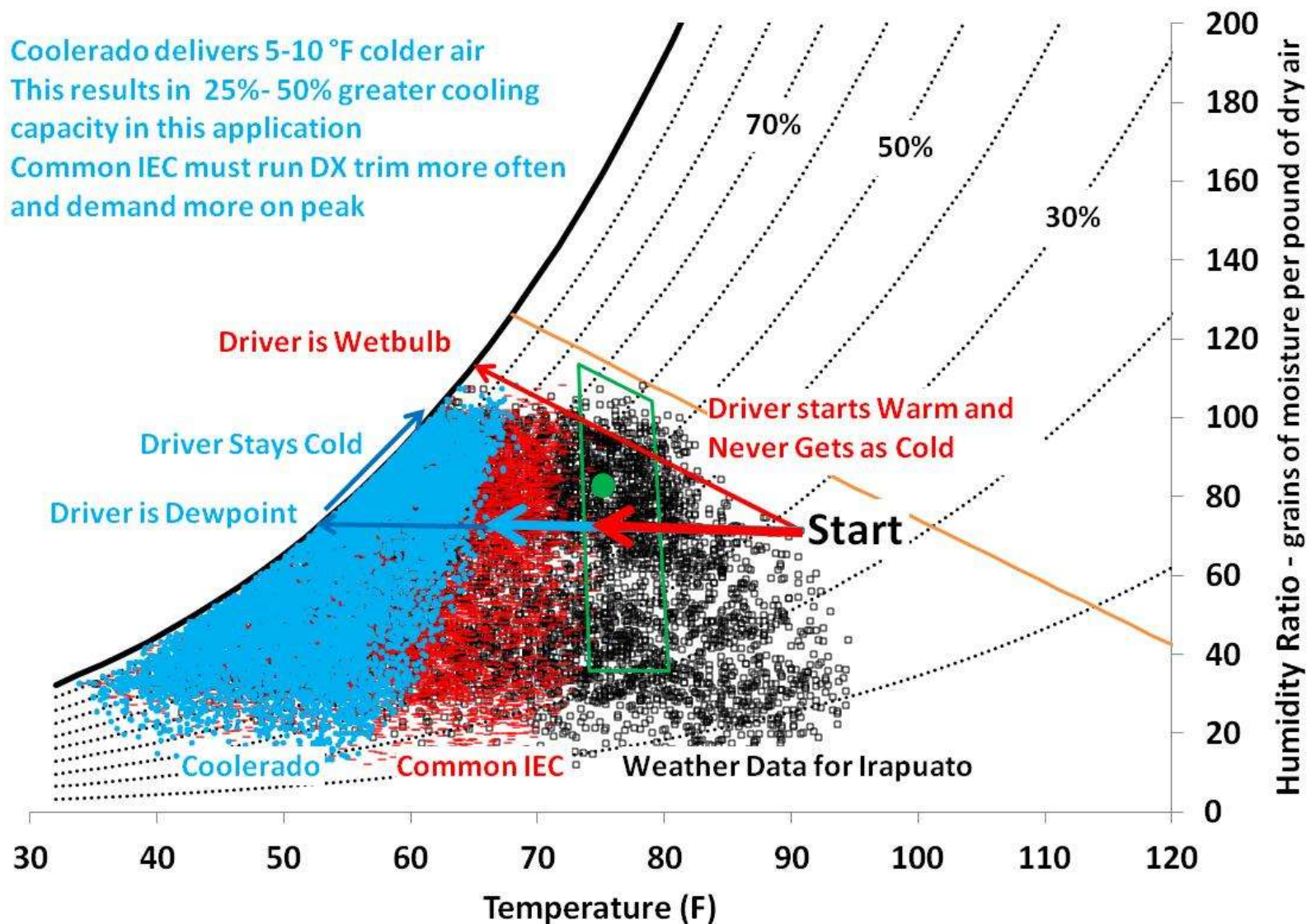




Common IEC Comparison



Coolerado delivers 5-10 °F colder air
This results in 25%- 50% greater cooling capacity in this application
Common IEC must run DX trim more often and demand more on peak





Irapuato 360ton Industrial Application

	Annual Cooling Efficiency kWh/tonh	Peak Demand kW/ton	Full Flow/Part Flow Wetbulb Effectiveness	Peak Demand kW	Energy Consumption kWh	Energy Savings KWh (\$)
Coolerado	0.13	0.3	95%/120%	110	128000	464,000 (\$55,700)
Coolerado Hybrid	0.14	0.5	95%/120%	180	138000	454,000 (\$54,500)
Common IEC	0.3	0.7	60%/70%	250	296000	296,000 (\$35,500)
Can not hold setpoint!						
Common IEC Hybrid	0.6	1.4	60%/70%	500	592000	0



Case Studies & Key Applications

McDonald's

The Challenge

Compressor's on one of the packaged units broke down and the owner needed to replace the 180,000 Btu/h (15 ton) unit. They were also struggling to keep up with the heat loads in the kitchen and drive-through locations.

The owner of the Franchise was immediately open to green ideas and suggestions on power savings equipment.



RESULTS

- 90% reduction in kitchen cooling consumption
- 70% total restaurant cooling reduction
- Payback of 2.3 years

LOCATION

- South Africa

PROPERTY TYPE

- Quick Serve Restaurant

COOLERADO SOLUTION

- 4 Coolerado M50s

National Snow and Ice Data Center

The Challenge

Help NSIDC's achieve a significant reduction in GHG footprint so they wouldn't be perceived as contributing to the very problem they were researching – the impact of GHG emissions on the polar ice caps

RESULTS

- 85-97% reduction in energy use
- Free cooling in shoulder season
- Drop in PUE from 2 to 1.09
- Saves \$54,000 a year in cooling



LOCATION

- Boulder, Colorado

PROPERTY TYPE

- Data Center

COOLERADO SOLUTION

- 8 Coolerado M50s

[NSIDC Savings Website](#)

Green House Data

The Challenge

Help Green House Data satisfy their mission of 'environmental' data processing, requiring a limited GHG footprint – key for their branding.

- Can use UPS to run Coolerado during power failure

RESULTS

- 90% reduction in energy use
- 40% reduction in total building energy consumption
- Zero down time
- Free cooling in shoulder season



LOCATION

- Cheyenne, Wyoming

PROPERTY TYPE

- Data Center

SQUARE FOOTAGE

- 2,000

COOLERADO SOLUTION

- 14 Coolerado M50s

Major Office Supply Retailer

The Challenge

Help this major retailer meet its aggressive environmental goals (reduced energy intensity, reduced energy consumption, reduced GHG emissions) while still meeting retail comfort specifications

RESULTS

- 50% less compressor run time
- 30% less energy used – resulting in significant savings
- 30% drop in green house gas emission
- Over 50% reduction in total store energy intensity in one project
- Hold set point during demand response



LOCATION

- Palm Desert, CA

PROPERTY TYPE

- Retail Store

SQUARE FOOTAGE

- 22,000

COOLERADO SOLUTION

- 6 Coolerado C-60's

Logan Regional Hospital

The Company:

Logan Regional Hospital is part of Intermountain Healthcare, an internationally recognized, nonprofit, system of 22 hospitals, a Medical Group with more than 185 physician clinics, and an affiliated health insurance company, SelectHealth.



Location

- Logan, Utah

Application Type

- Surgical Room

Square Footage

- 1,000

Coolerado Solution

- 8 M50s

The Challenge:

Logan Regional Hospital, located in Logan, Utah, was looking for a more efficient way to cool its surgical room. Like all hospitals, Logan is required to change over the air in its surgical room at least 25 times an hour to help eliminate infection. And, while this is beneficial to patients, it can be tough on an organization's cooling bill. It's like running your air conditioner with the windows open.

Logan Regional Hospital

The Solution:

When Troy Jensen, Intermountain's Energy Efficiency Manager, heard about Coolerado's unique cooling technology—that uses 100% fresh air while reducing cooling energy consumption by up to 90%—he became an instant fan. Eight M50s later, the hospital is enjoying substantial energy savings and a comfortably cool and fresh surgical room.



“Intermountain will install the units in other departments and other hospitals, as appropriate and needed,” said Troy. “The goal is simple – don’t waste energy.”

Kellogg's Cereal Processing Plant



To accomplish their goals, the company chose Coolerado to provide energy-efficient cooling in its Mexicali, Mexico, manufacturing plant.

In terms of a direct dollar save due to the large energy reduction, the Coolerado system **will save over \$62,000 annually.**

Joint Strike Fighter Program



Cooling mobile/field data centers for the F-35 Lightning II Team (Joint Strike Fighter Program) – the Department of Defense's focal point for defining affordable next generation strike aircraft weapon systems for the Navy, Air Force, Marines.



Huawei - ETB Data Center

- Cooling solution for ETB's new IPTV Data Center in Bogotá. (ETB is a large communication company in Colombia)
- Huawei won the project over other strong competitors based on Coolerado's unique energy saving cooling technology
- Load 130Kw, Operation 24 X 7
- Design included mixing box with dampers and actuators to allow the system to use either 100% outdoor air or to use 100% circulated air from the hot aisle
- 2N with 2,000 liter (530 gal) water storage tank backup.



LOCATION

Bogota, Colombia

PROPERTY TYPE

Tier III, Data Center

Dimensions

Area - 107 m² (1,150 ft²)

Ceiling Height - 3 m (10 ft)

COOLERADO SOLUTION

24 Coolerado M50s total,
12 M50s in operation,
12 M50s in standby

Huawei- ETB Data Center

RESULTS

- Design Cold Isle set point 22°C (72°F)
- Saving on electrical infrastructure upgrade, CAPEX avoided \$350K.
- No Down Time
- CO² emission reduction
- 80% energy reduction
- PUE of 1.1
- Free cooling in shoulder season
- Fully integrated to EBMS



The Company:

- IGA is an independent grocery supermarket that is owned by the store manager, but is a part of a national buying group.

Location

- Bacchus, Marsh,
Victoria, Australia

Property Type

- Supermarket

Square Footage

- 1,700 sq. meters
- 5,577 sq. ft.

Coolerado Solution

- 6 - Coolerado M50s

Configuration

- Stand-alone-2 banks of three



IGA Challenge

Customer was extending the supermarket to double its size. To supply cooling systems to the new extension they would need to increase the size of the main power supply plus upgrade the transformer. The electrical upgrade would have cost \$105K without any new air conditioning units.

The Installation:

- 6 Coolerado M50s
- Two banks of three M50s
- One T-stat per bank of three M50s.
- We also collected the cold return air from meat cabinets and mixed in with the Coolerado supply air.
- Banks of Coolerado units are separated to serve different parts of the store. Bank one serves the rear of the store, and the second bank serves the front of the store.
- Spiral duct was used throughout the supermarket with the height being no more than 3 meters (9 feet) above the ground.



RESULTS

- Coolerado has maintained 23°C or 73.4°F.
- Service/Maintenance cost drastically reduced.
- Positive reference to IGA buying group. We are now in discussion with four other projects.

STATER BROS.

| GROCERERS



Kruger National Park Store, Shingwedzi Camp

| GROCERERS



- 1st of 13 “The Park Shop” location through out Kruger Park, South Africa
- Cooling store with front doors open during working hours
- Using Coolerado exhaust air to lower temperature across the refrigeration cabinet’s compressor/condenser, increasing their efficiency by ~10 - 20%



AISO Data Center - CA



Green House Data - WY



TRACT ARCHITECTS DATA CENTER



CHARLES STURT UNIVERSITY

Charles Sturt University's (CSU) is committed to achieving excellence in education for the professions and to maintaining national leadership in flexible and distance education. Sustainability and global citizenship are central values of this Australian multi-campus university.

Location

- Wagga Wagga, Australia

Property Type

- University life science building

Square Footage

- 800 M²

Coolerado Solution

- 13 x M50 units in 4 x air handling systems

Configuration

- Hybrid



CSU's Challenge:

Wagga Wagga is a city in New South Wales, Australia with maximum temperatures ranging between 29 and 32 °C (84 and 90 °F). The hottest temperature on record was 45.2 °C (113.4 °F). The challenge was to reduce the cost of cooling without reducing the comfort within the building while meeting the demanding fresh air requirement.

CHARLES STURT UNIVERSITY

- 13 - M50 units in 4 - air handling systems
 - 3 M50s in 3 systems
 - 4 M50s in 1 system
- Air handlers bring ambient air into the return air stream when the ambient air is below 21°C.
- When ambient temperature are above 21°C, Coolerado's M50 supplies cooled, fresh air into the Air Handling systems substantially reducing need for call on compressors
 - Installing contractor impressed with the ease of installation and connectivity
 - Client is excited reducing energy consumption and maintaining comfort



Example Coolerado Installations

Engineering Company Data Center – Netherlands *Commercial – Data Center*



1 C60 cooling corporate data center

Sold through Coolerado EU



Example Coolerado Installations

Production Building – Carretara, Mexico

Cooling Data Room for production equipment





- Coolerado's peak load 3.4 Amp
- DX's peak load 27 Amp
- Coolerado maintained data room temperature slightly lower than DX with a slightly higher RH
- Coolerado's water use approx. 7.5 l/h
- Water recovery was approx. 20% of total



JOINT STRIKE FIGHTER



Cooling mobile/field data centers for the F-35 Lightning II Team (Joint Strike Fighter Program) – the Department of Defense's focal point for defining affordable next generation strike aircraft weapon systems for the Navy, Air Force, Marines.



Monash University IT Room Melbourne Australia



MONASH University

TelePoint Data Center Sophia, Bulgaria





- Phoenix, AZ
- 24 M50 in hybrid with existing RTU
- Currently collecting data



- Bakersfield, CA
- Installed 2013
- 2 M50 test installation
- Currently collecting data



La Crescenta,
CA

4 Coolerado
C60

6,680 cfm fresh
air

Up to 28% fresh
air

Installed 2012

Coolerado
selected as
national vendor
and currently
rolling out
nationally



HMX Component Applications

Nestle



Sacramento Central Utility Plant



Bradford Publishing

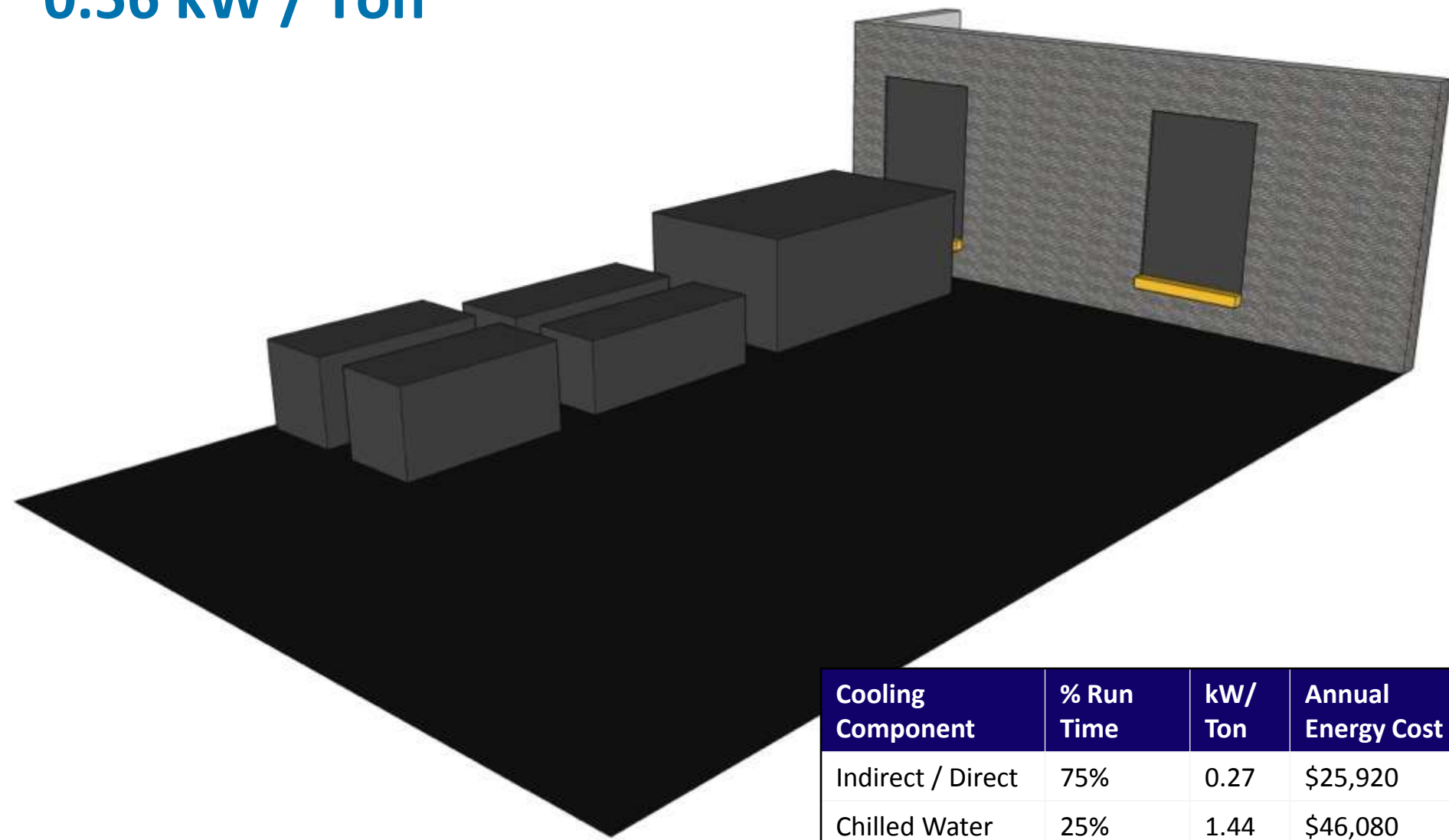


School of Mines



Sample Mechanical Configuration (does not include Cooling tower)

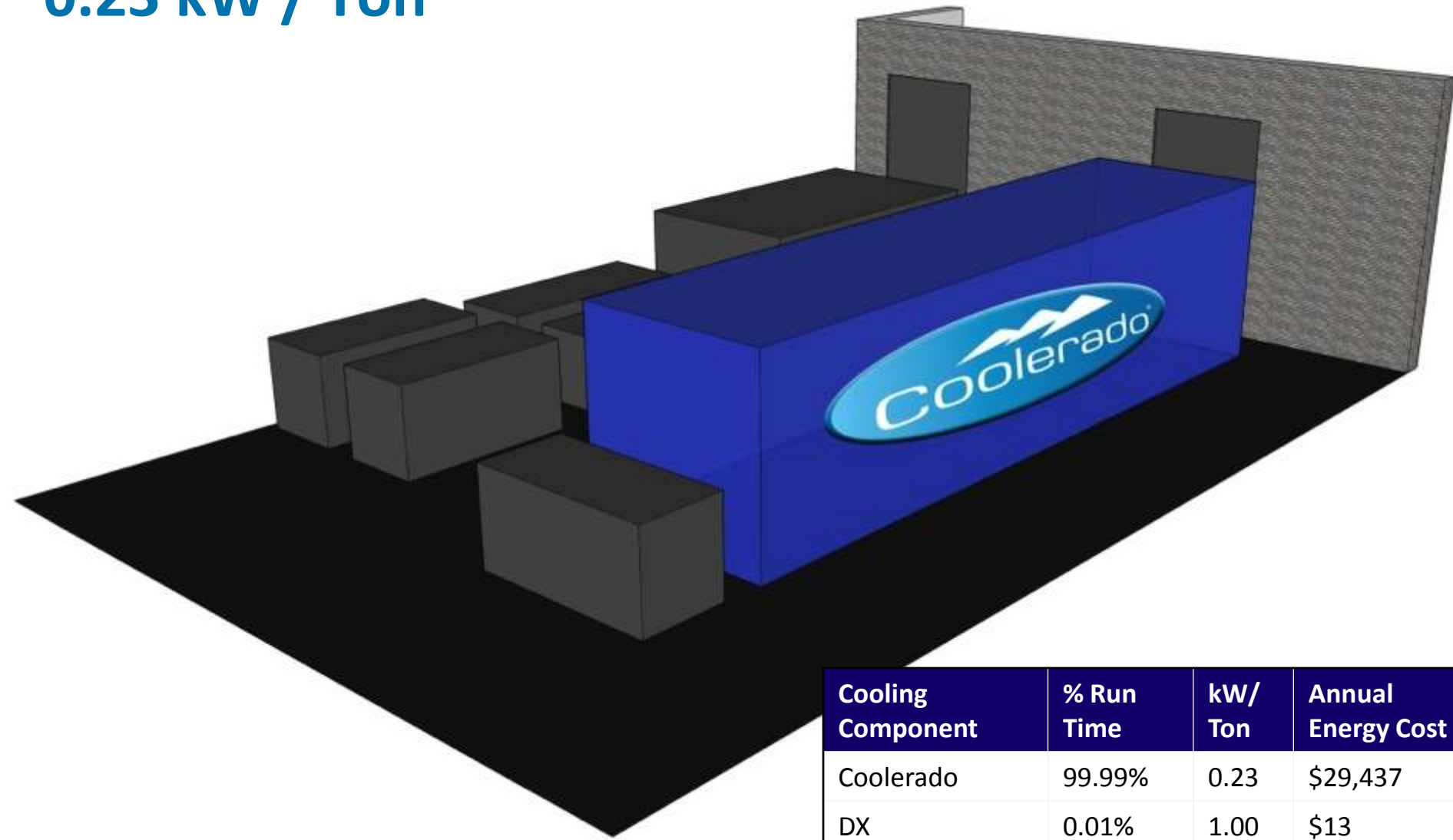
0.56 kW / Ton



Cooling Component	% Run Time	kW/Ton	Annual Energy Cost
Indirect / Direct	75%	0.27	\$25,920
Chilled Water	25%	1.44	\$46,080
Total	100%	0.56	\$72,000

Sample Coolerado Configuration (does not include Cooling tower)

0.23 kW / Ton



Cooling Component	% Run Time	kW/Ton	Annual Energy Cost
Coolerado	99.99%	0.23	\$29,437
DX	0.01%	1.00	\$13
Total	100%	0.23	\$29,450

Sample Las Vegas Data Center ROI

(per 200 ton module assuming \$0.08/kWh)

	Conventional System	Coolerado System	Delta	Delta as %
Capital Expense	\$500,000	\$575,000	(\$75,000)	-15%
Annual Electricity Expense*	\$72,000	\$29,450	\$42,550	59%
Annual Operating Expense**	\$84,000	\$45,448	\$38,552	46%
Annual kWh Consumption	900,000	368,123	627,867	59%

Payback Period: 1.88 Years

NPV: \$216,613

* Does not include savings from reduced demand or peak charges

** Does not include service and maintenance costs

Sample East Coast Data Center ROI

(per 120 ton module with \$0.10/kWh)

	ASE w/ Evap Condenser	Coolerado IASE	Delta	Delta as %
Capital Equipment	\$300,000	\$300,000	0	0%
Capital Infrastructure @\$3,000/kW	\$450,000	\$150,000	\$300,000	67%
Annual Electricity Expense*	\$20,000	\$16,000	\$4,000	20%
Annual Operating Expense**	\$24,000	\$22,000	\$2,000	8%
Annual kWh Consumption	200,000	160,000	40,000	20%

Payback Period: Immediate

NPV: \$321,000

* Does not include savings from reduced demand or peak charges

** Does not include service and maintenance costs

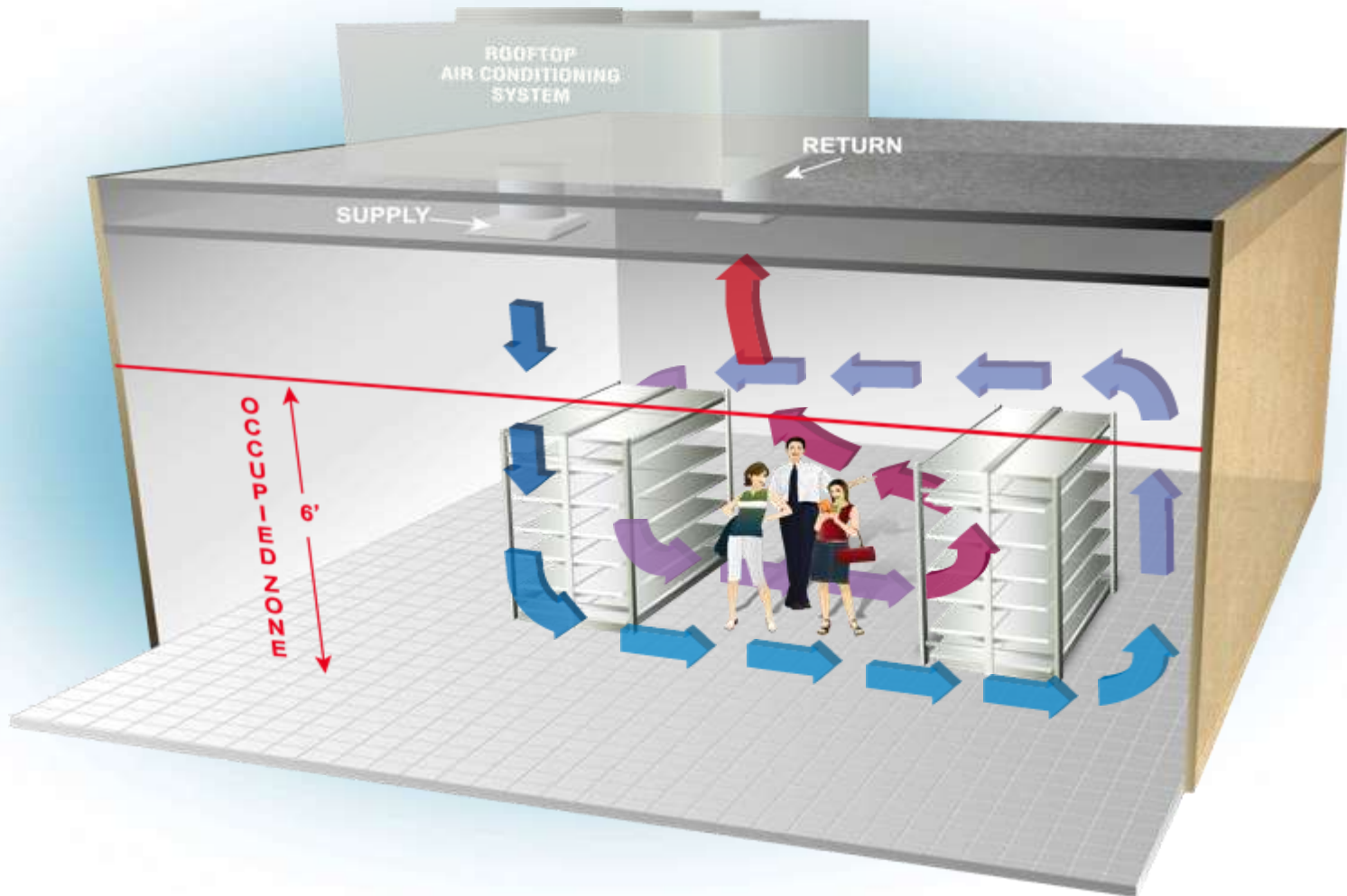


The Greenest Way To Stay Cool

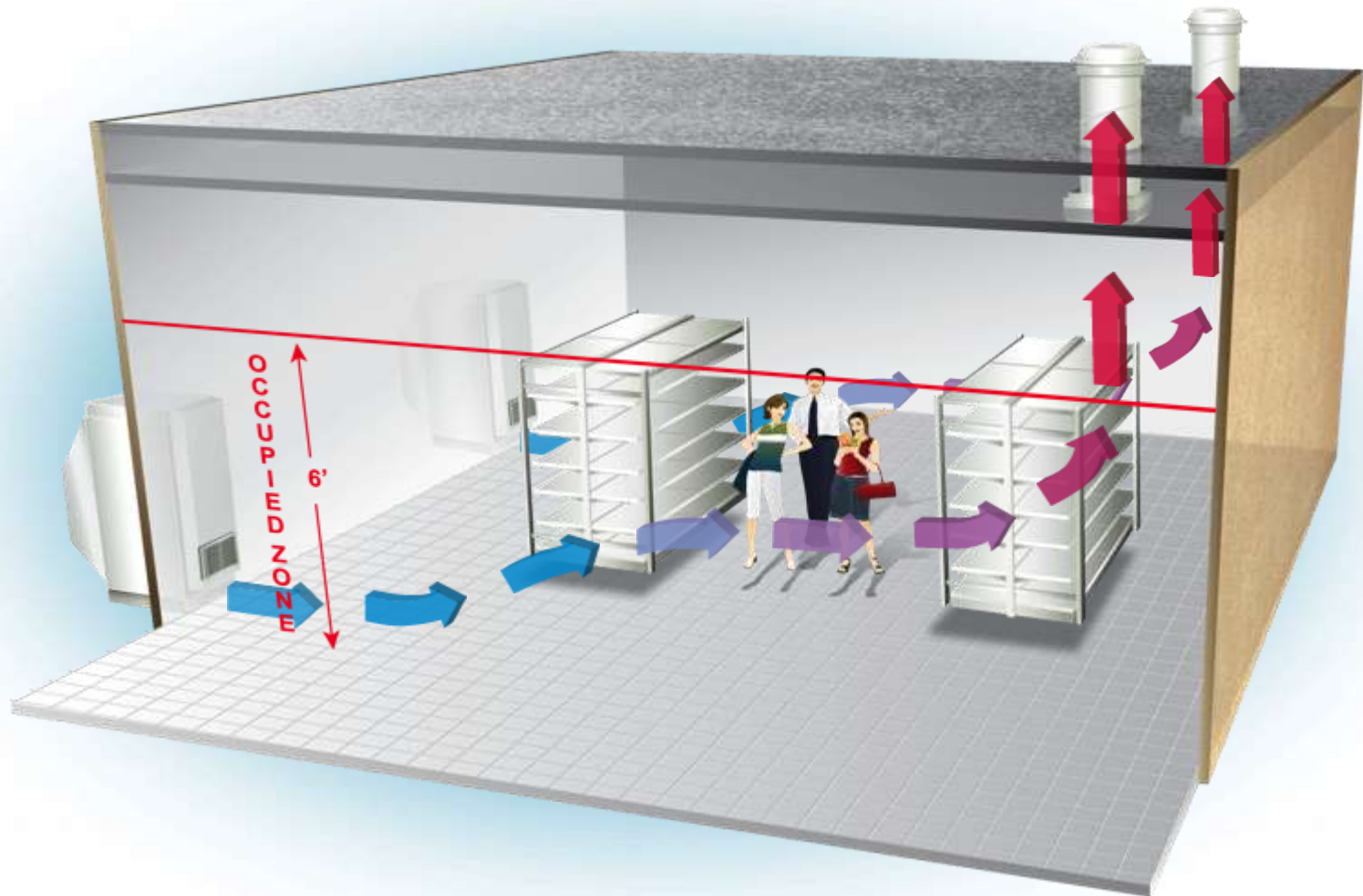


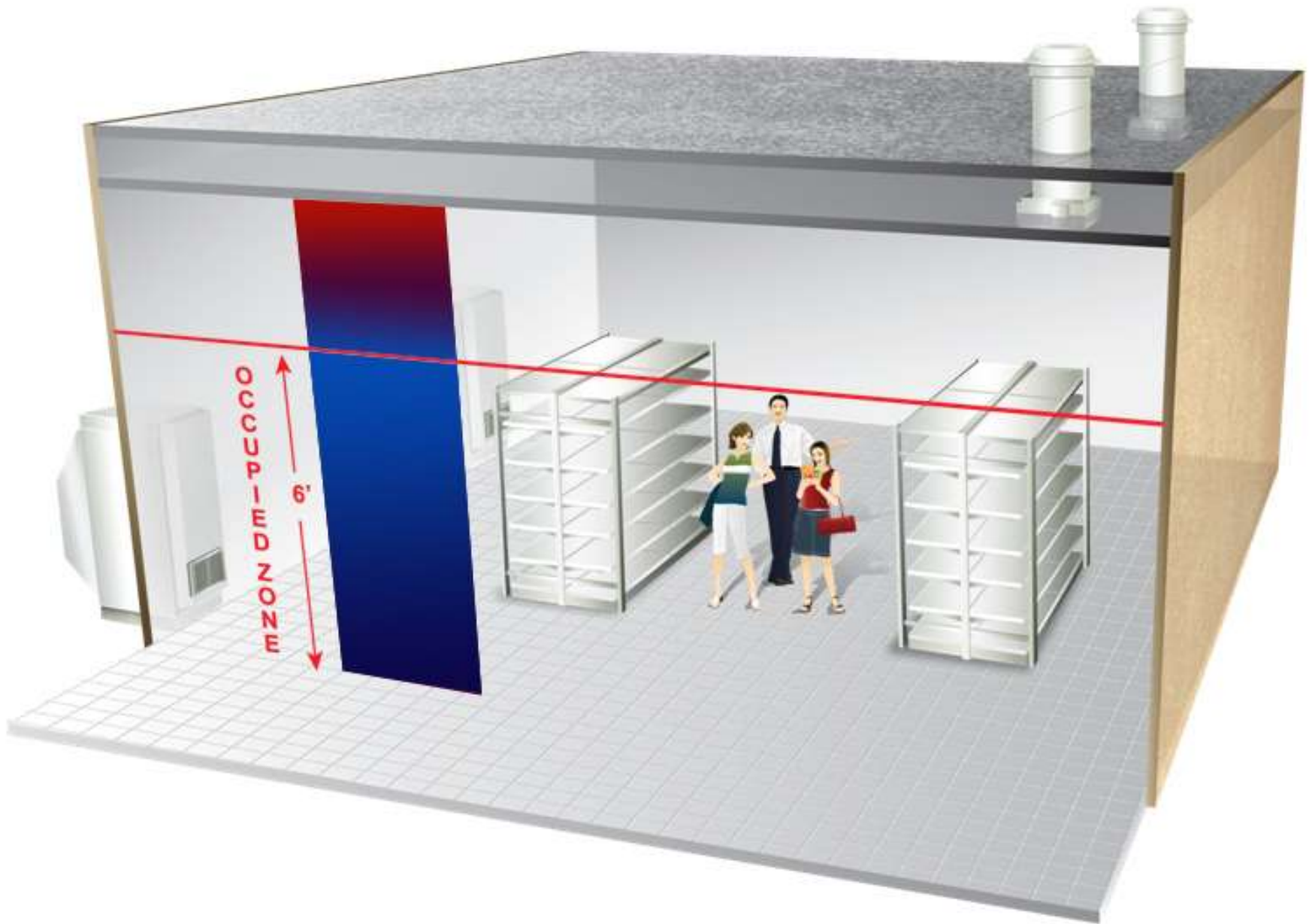
Displacement Cooling

Mixing Ventilation

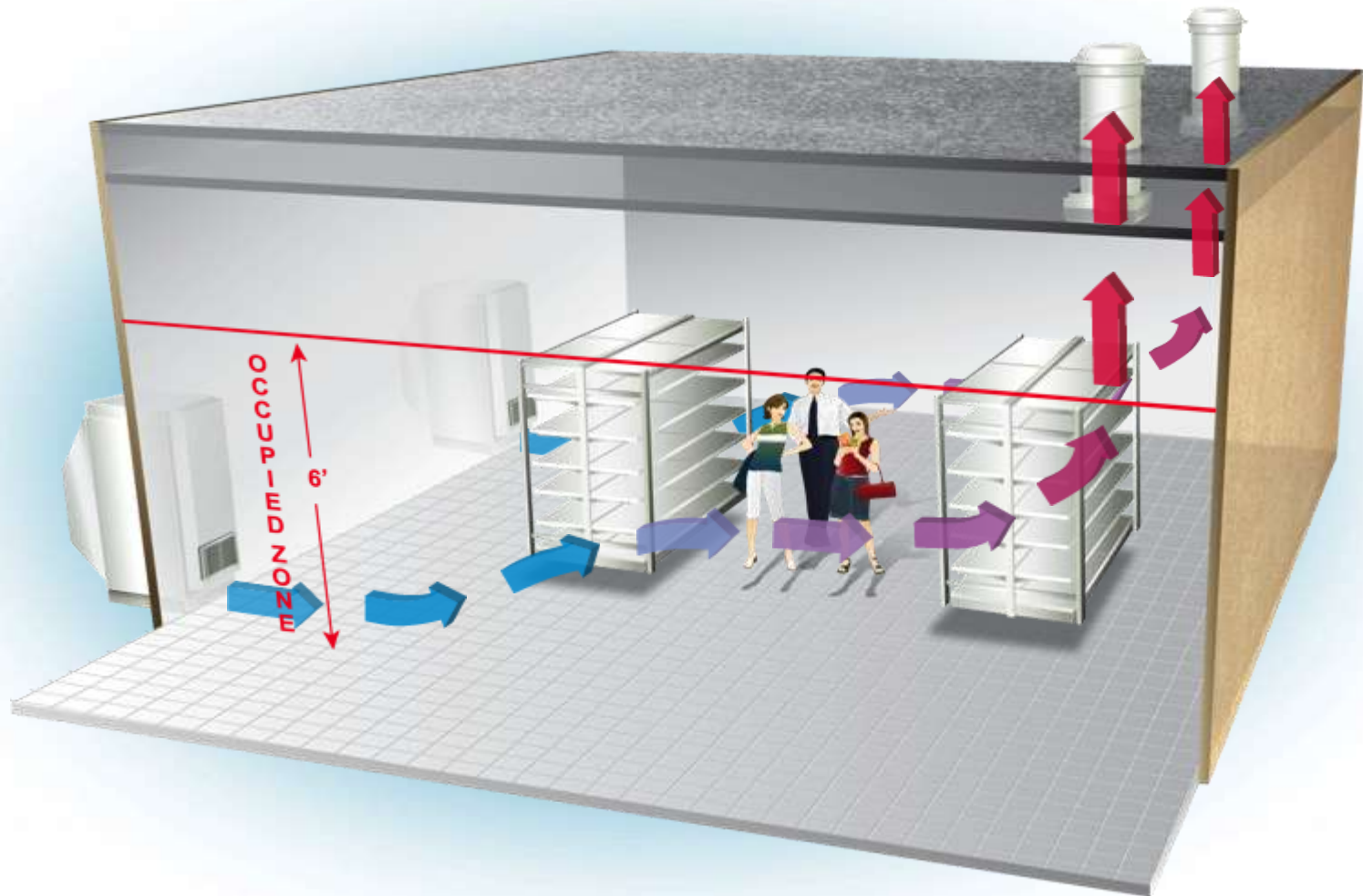


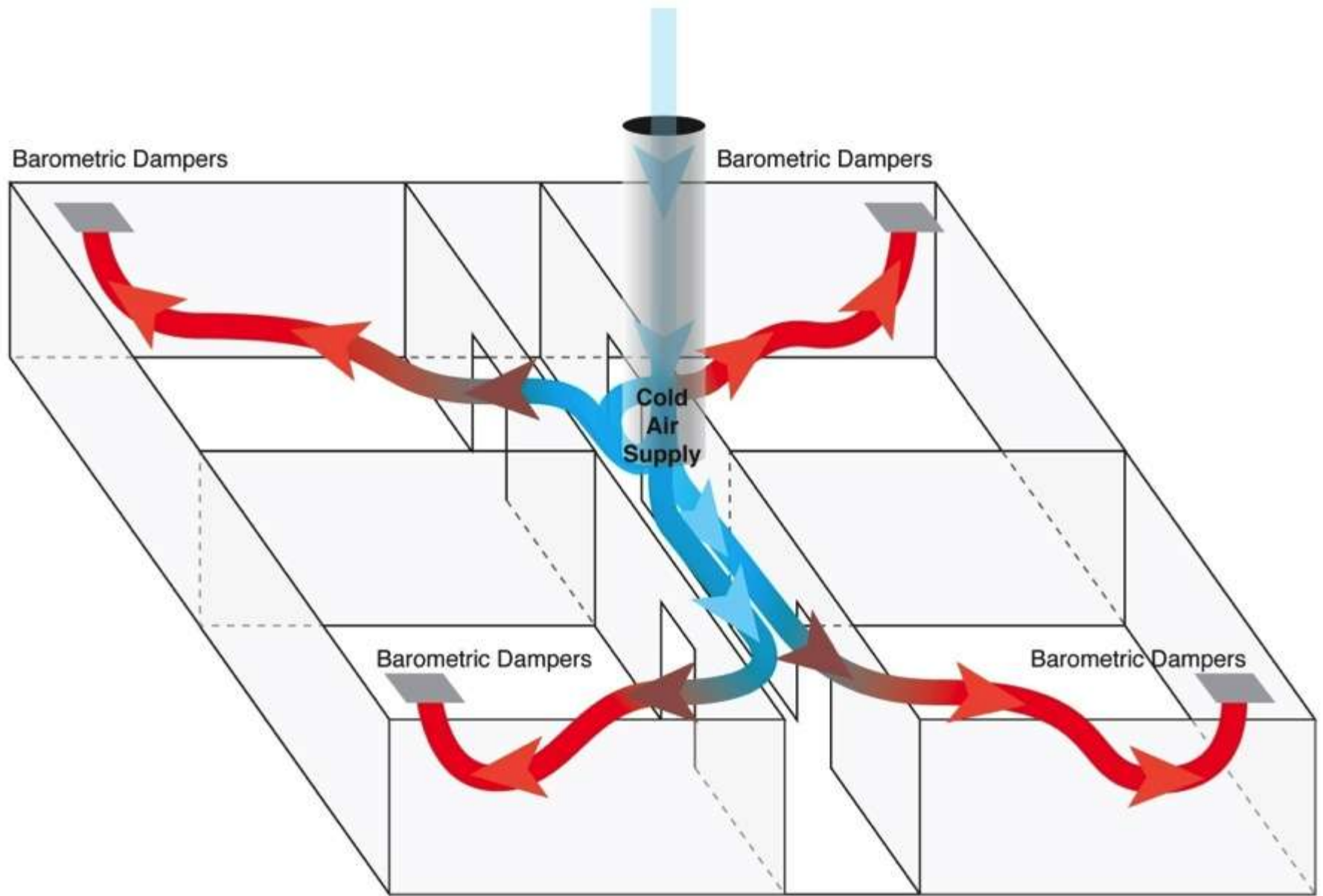
Ideal Displacement Ventilation

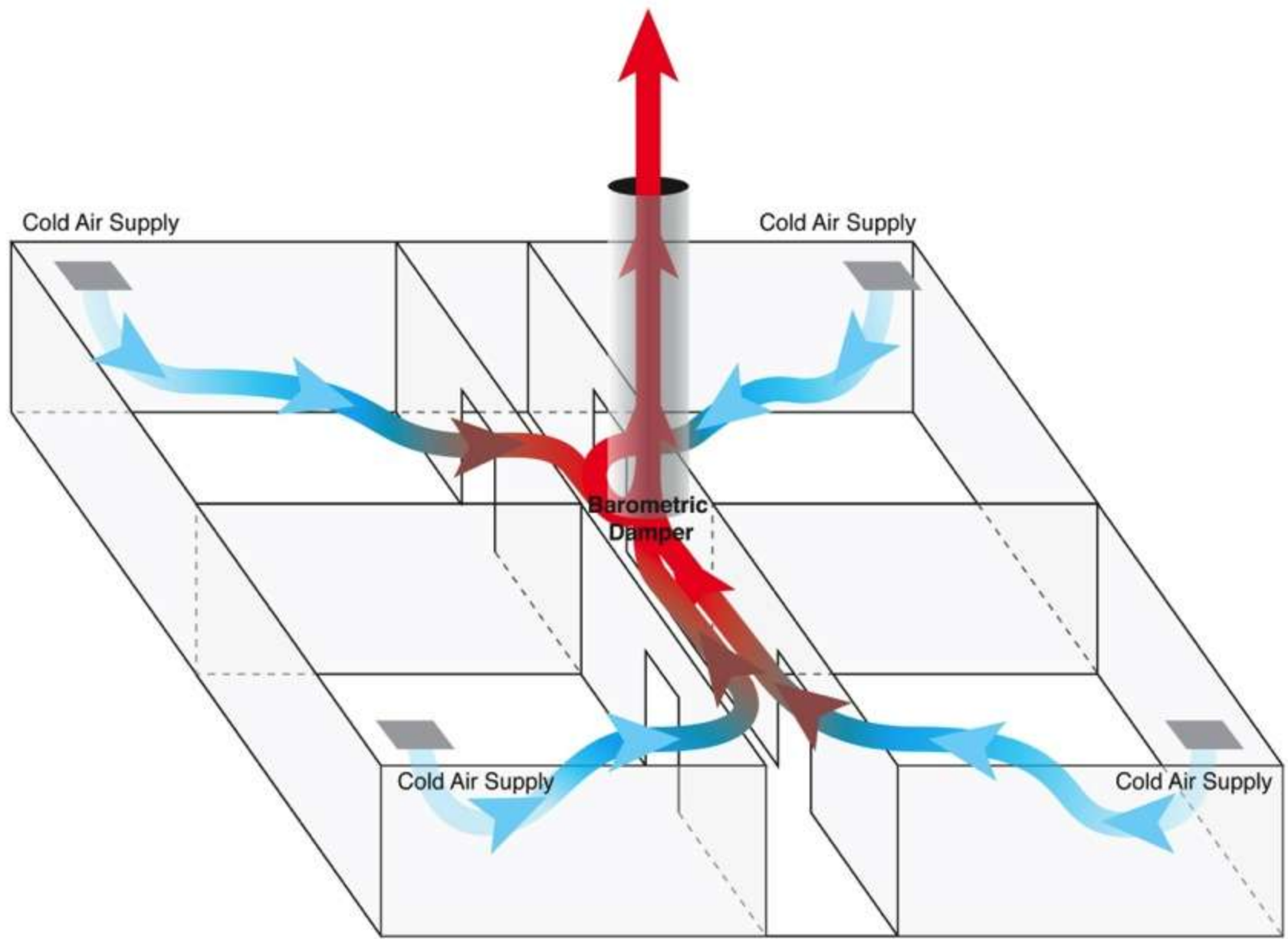




Ideal Displacement Ventilation



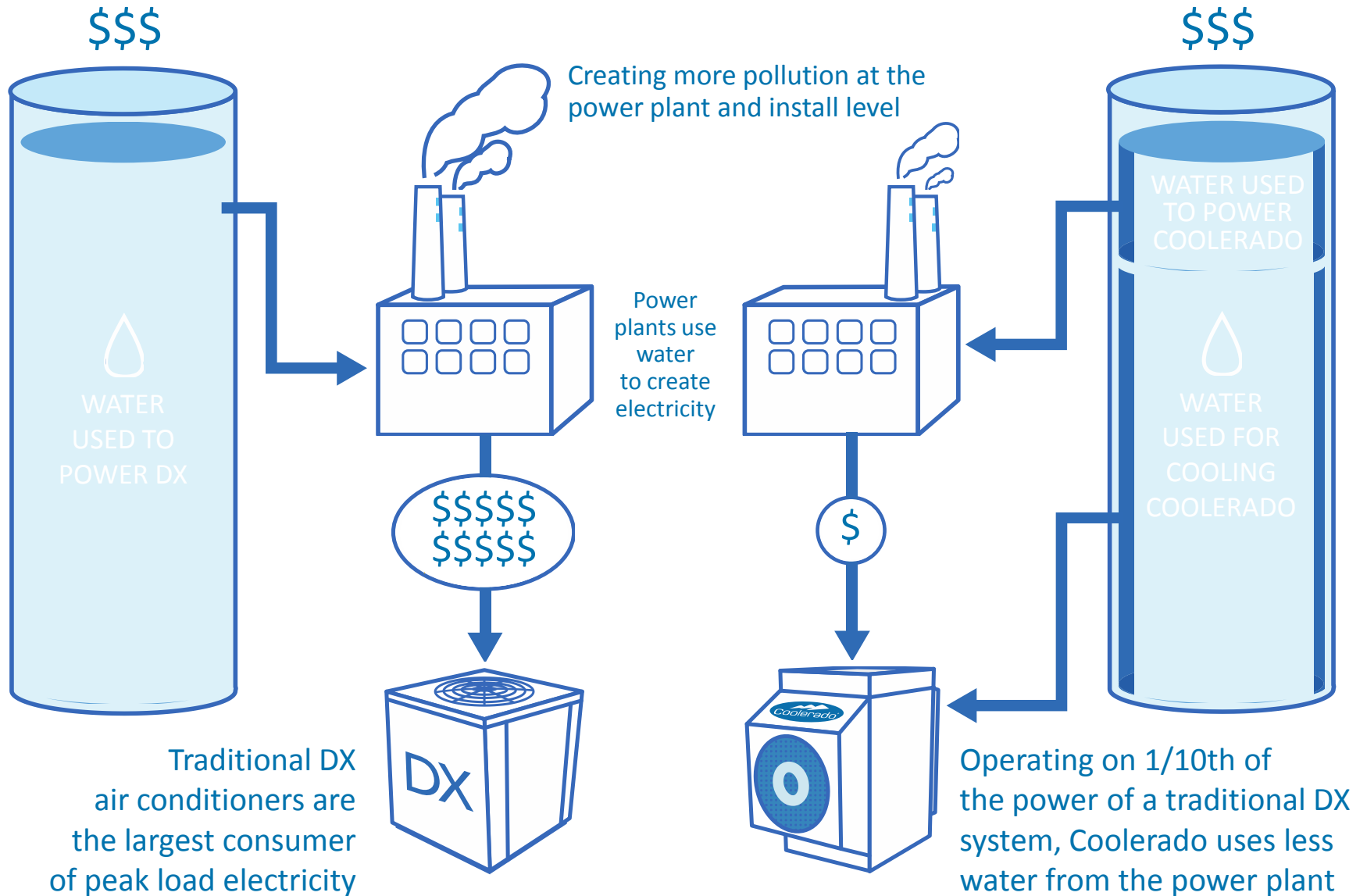




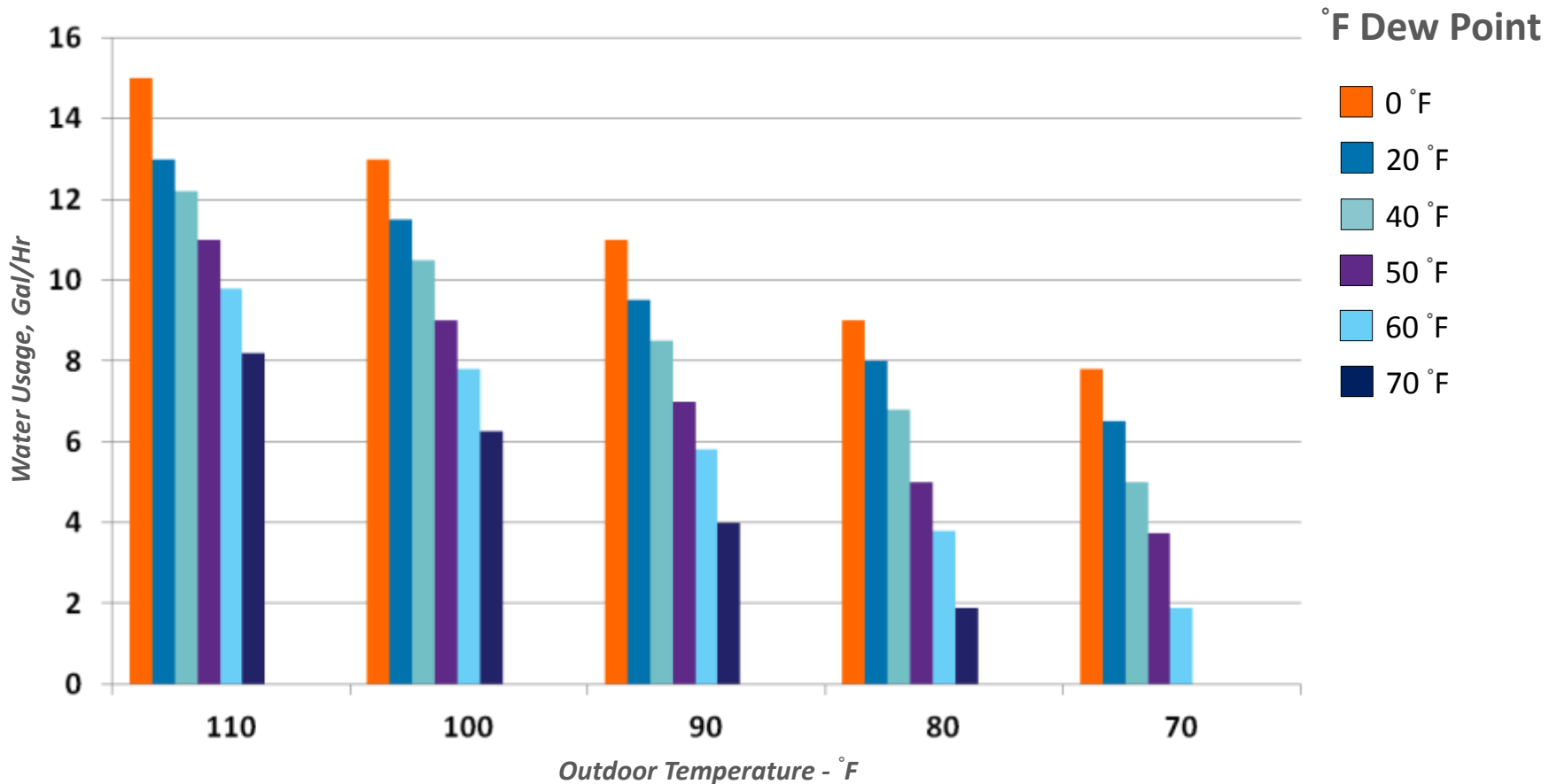


Water Usage and Sample Cost

Water and Sustainability



Sample Water Usage With Temperature Increase – Coolerado M50 Example



Notes:

1. Assumes full air flow rate of 1,400 CFM
2. Water usage rates are + or – 15%
3. Drain water approximately 25% of total water usage, draining continually