



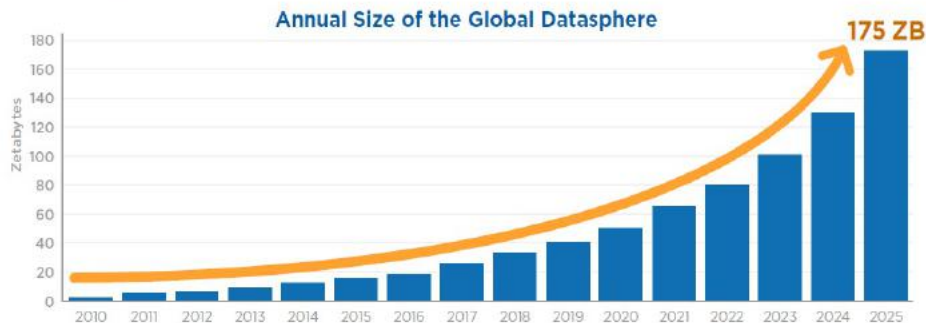
Systemair Group

Sustainable Data Center Cooling

Data Centre cooling impact

- Data Centres represent around 3% of world power consumption and discharge ~ 200 million metric tons of CO2 annually
- Cooling is one of the top issues in current data centres and critical to their availability
- Cooling & ventilation represents 30-40% of power consumption in a data centre
- Huge influence in overall data centre efficiency

Figure 1 - Annual Size of the Global Datasphere



B. Whitehead et al. / Building and Environment 93 (2015) 395–405

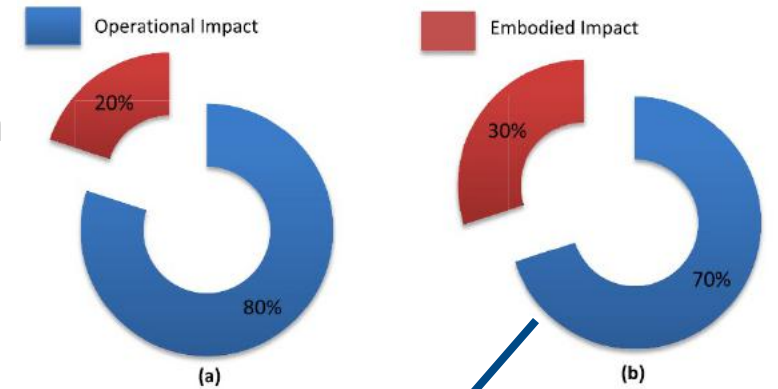
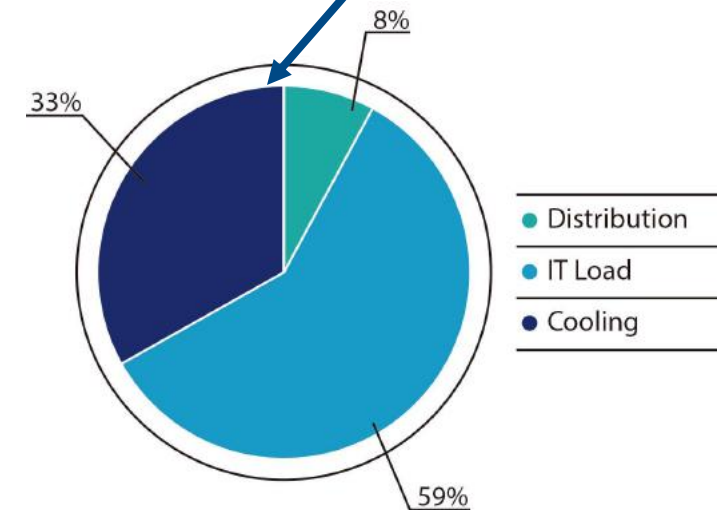
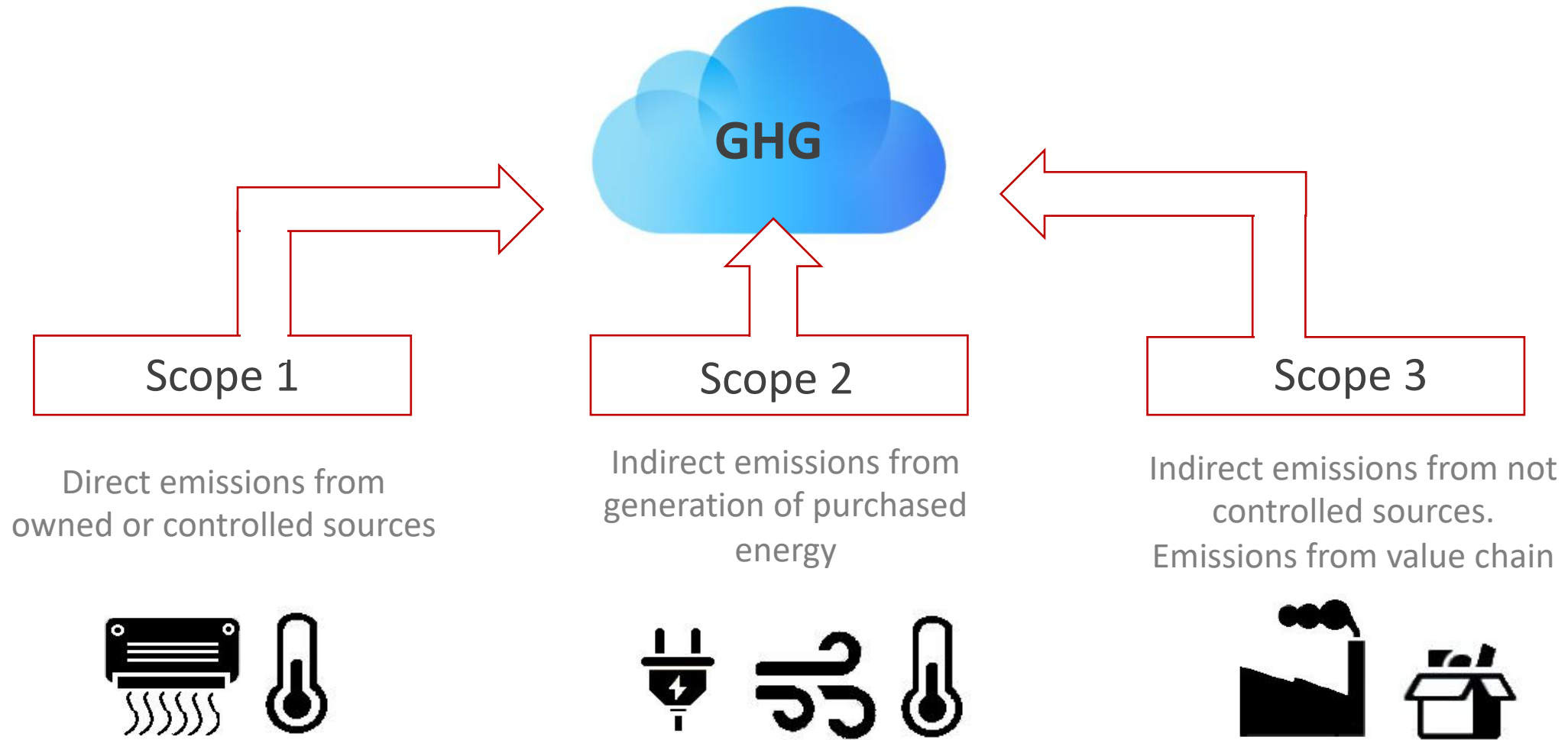


Fig. 2. Operational and embodied impacts of a computer (a) and a building (b).



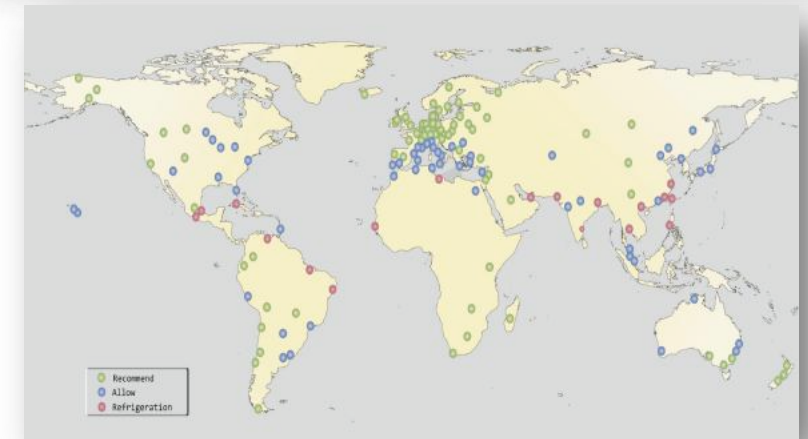
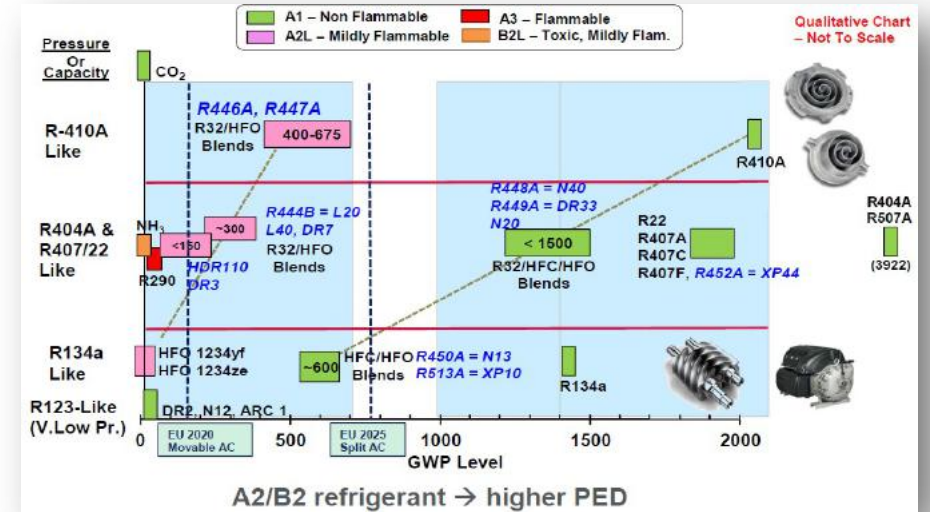
Greenhouse gas emissions by Data center



SCOPE 1. Direct Emissions.

Refrigerant

- F-gas ban - "future proof cooling" ?
- No/limited usage of supplementary cooling
- Right now - trend towards Indirect or direct air-cooling when possible (location, density & type of datacenter to be the divider).



(Source: Operational Intelligence)

SCOPE 2. Consumed energy

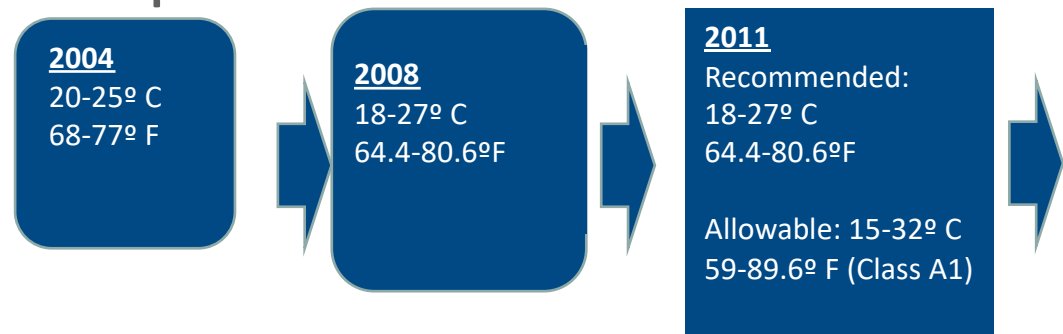
Extend temperature envelope and SLA

- Cooling temperature – we over cool and not to server specifications
- New hardware is able to work in much warmer conditions
- Proper Containment & air management to reduce airflow

Ex: 200 kW with dT 12C: 49 600 m3/h

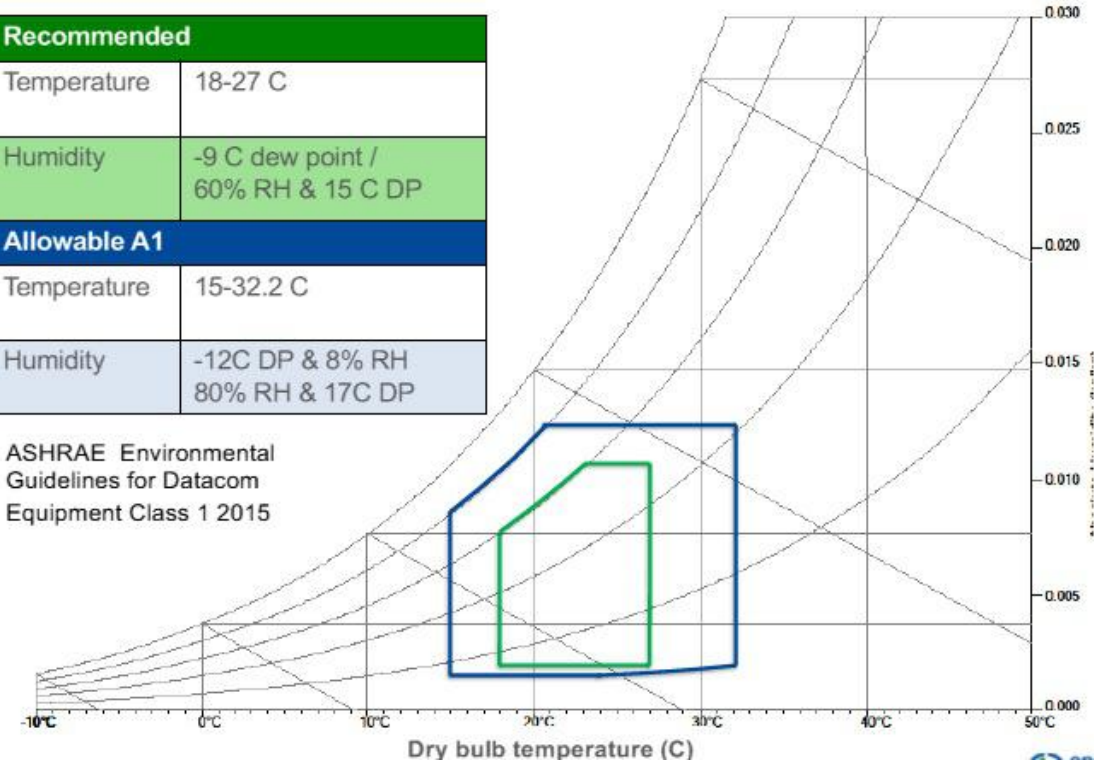
vs 200 kW with dT 8 C: 74 400 m3/h

ASHRAE- Progressively Expanding the Thermal Envelope



Recommended	
Temperature	18-27 C
Humidity	-9 C dew point / 60% RH & 15 C DP
Allowable A1	
Temperature	15-32.2 C
Humidity	-12C DP & 8% RH 80% RH & 17C DP

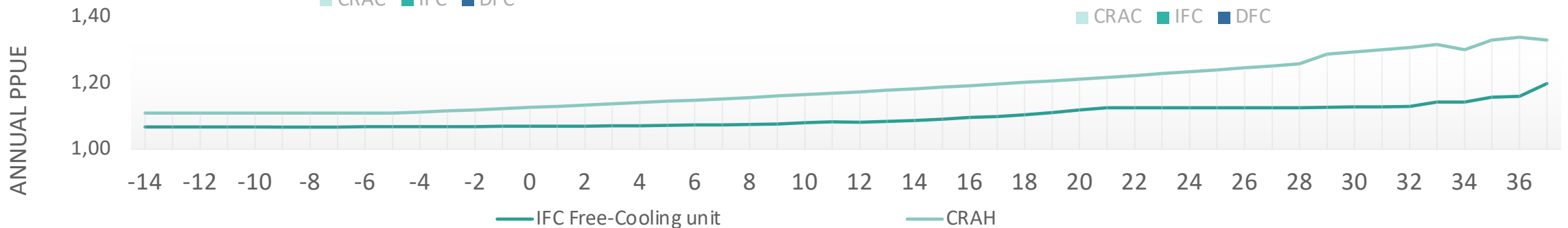
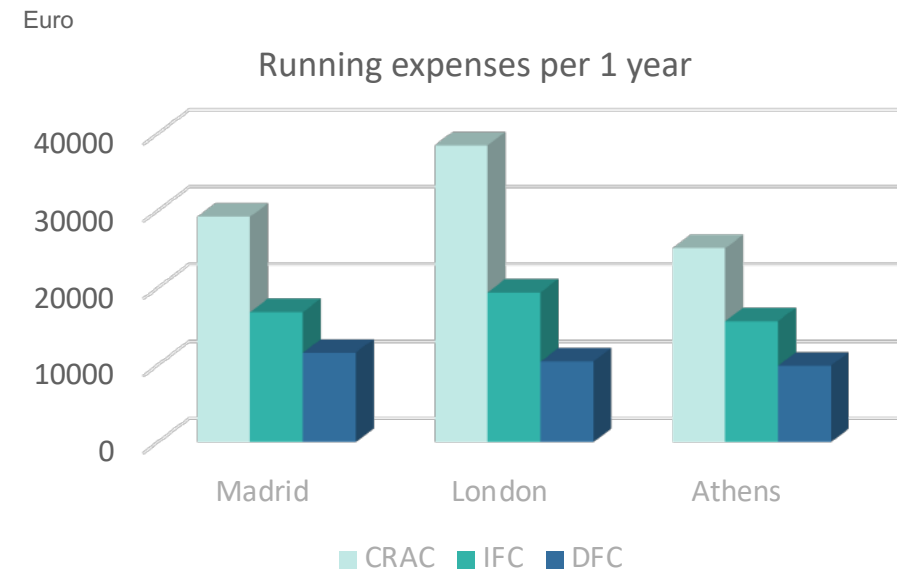
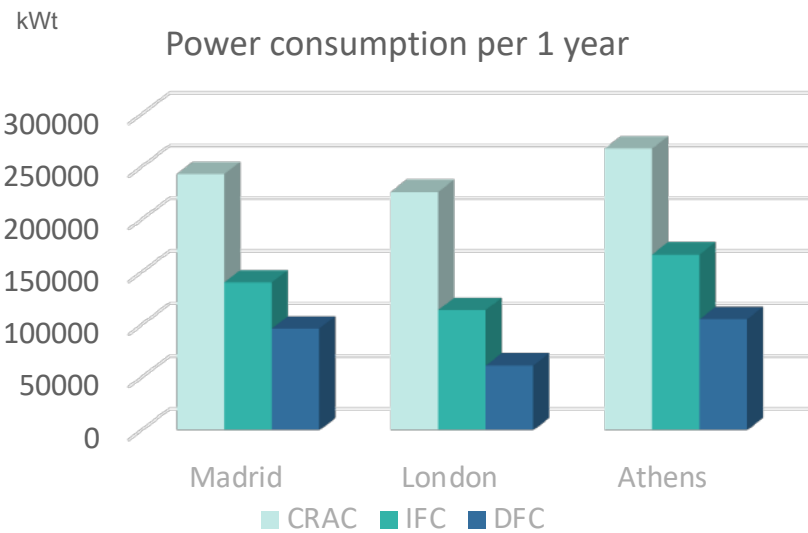
ASHRAE Environmental Guidelines for Datacom Equipment Class 1 2015



SCOPE 2. Consumed energy

Solutions comparisson

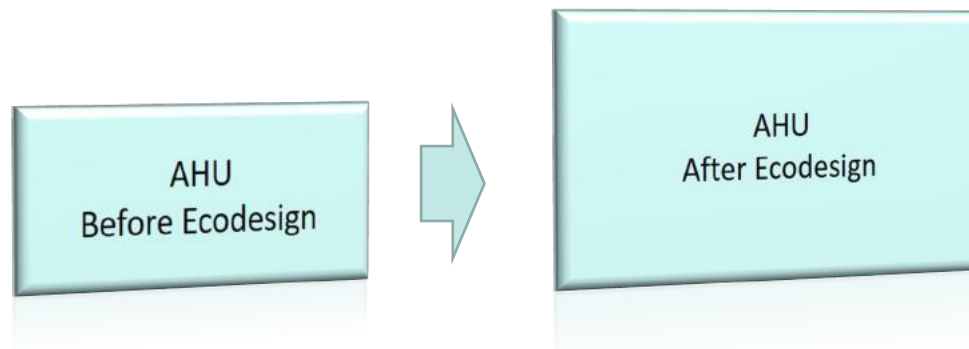
- Compressor is the most energy hungry component in the cooling unit.
- Free-cooling technology is aimed to reduce or even avoid compressor usage



SCOPE 2. Consumed energy

Every Pascal counts

- Smaller dimensions of the cooling equipment lead to increased velocities over the coils and heat exchanger, resulting in a reduction of heat transfer efficiency and unstable temperature distribution.
- A simple exercise calculating the same system with different pressure drops, shows that just an extra 100Pa in one Indirect free-cooling unit leads to an 18-20% increase in fan power consumption and significant increase of OPEX.



To Sum up:

The smaller the cross sectional area is made, the higher the global impact and TCO

SCOPE 3. Supply chain

Choose Selected suppliers who Focus on sustainability

Systemair works constantly and methodically to reduce the impact on the environment from the business and our products.

We do this by reducing our own consumption of energy and materials and staying at the forefront in the use of smart manufacturing technology.

This results in high efficient products and solutions, contributing to our customers projects.



Geniox Tera

Geniox Tera

General description

- Capacity range up to 395 kW
- Compact dimensions
- Rooftop and Perimeter configurations
- High flexibility for even most challenging installation configurations
- Optional heat recovery module
- Optional Integrated DX cooling circuit
- Ready to operate in extreme outdoor air conditions



Geniox Tera

Key benefits

- Ultra efficient free-cooling with no outside air in the data center
- Low pPUE thanks to minimal pressure drops
- Low water consumption
- Minimized or eliminated need for mechanical cooling
- Optional DX module with Digital compressor for precise control even at lowest loads



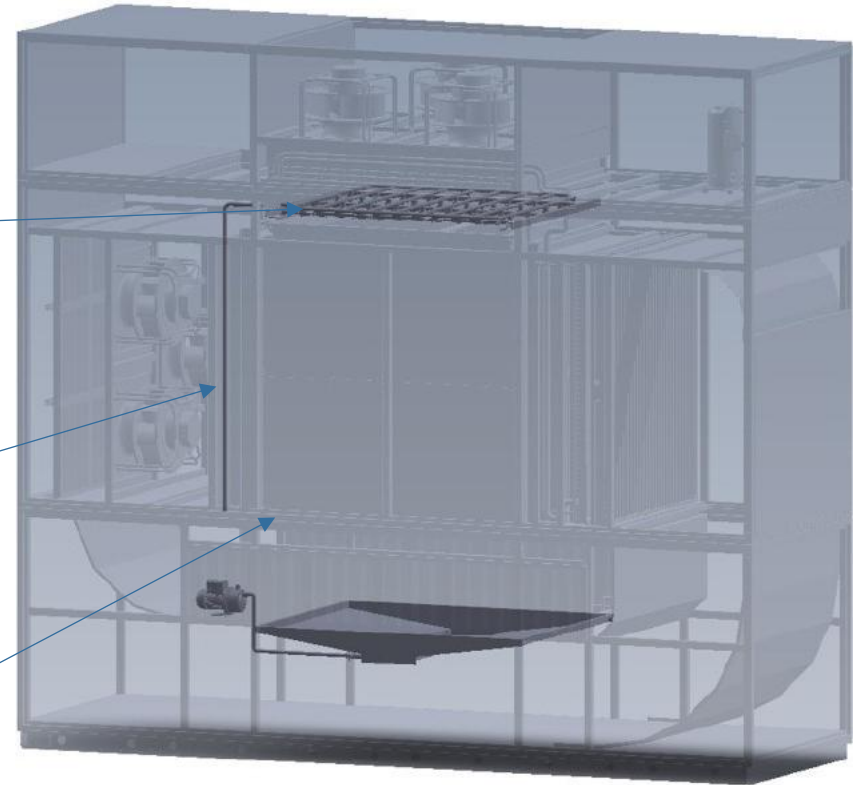
Geniox Tera

Minimize water consumption

Special Nozzles design guarantees 100% HE surface coverage with minimum water sprayed

Several stages of Water quality control and Built-in water treatment system to assure lowest water bleed-off

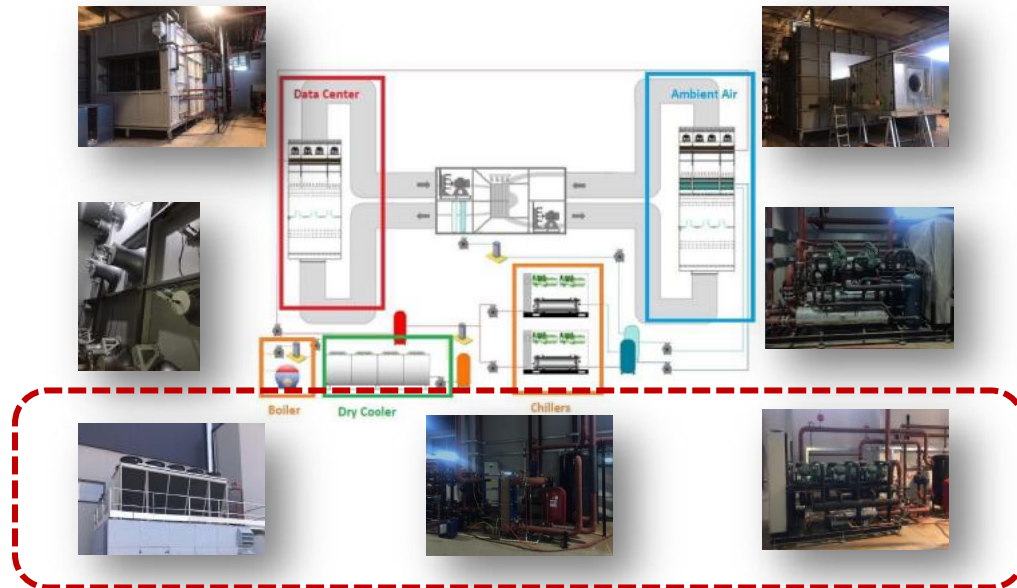
Optimized HE design for Reduced Air pressure drop



Systemair holistic focus on Sustainability

Embodied CO2 Emissions report

- Systemair Geniox IFC units CO2 footprint is calculated in the selection soft and will be indicated in the data sheet
- Methodology developed together with Istanbul Technical University



Heat recovery system

- Modern Systemair Test Centre is designed with Deep focus on sustainable solutions
- Heat recovery system allows to reuse heat generated by testing equipment.

Holistic Approach.” Consumer or enabler ?”

Offices



Green house



Residential



Sport complex



Data centre



Logistic centre



Shopping Mall



Restaurant



Garage



Individual Project Approach & Location

- Every Data Center has its specific demands and features: layout, scalability, density, location, heat recovery, integration into common Eco-system, etc.
- Big data centres close to power source and good connectivity
- Smaller data centres will be placed in urban environments
- Data Centre Integration into the eco-system
- Having wide range of products, Systemair always works out the optimal solution for your Data Center.



Thank you!