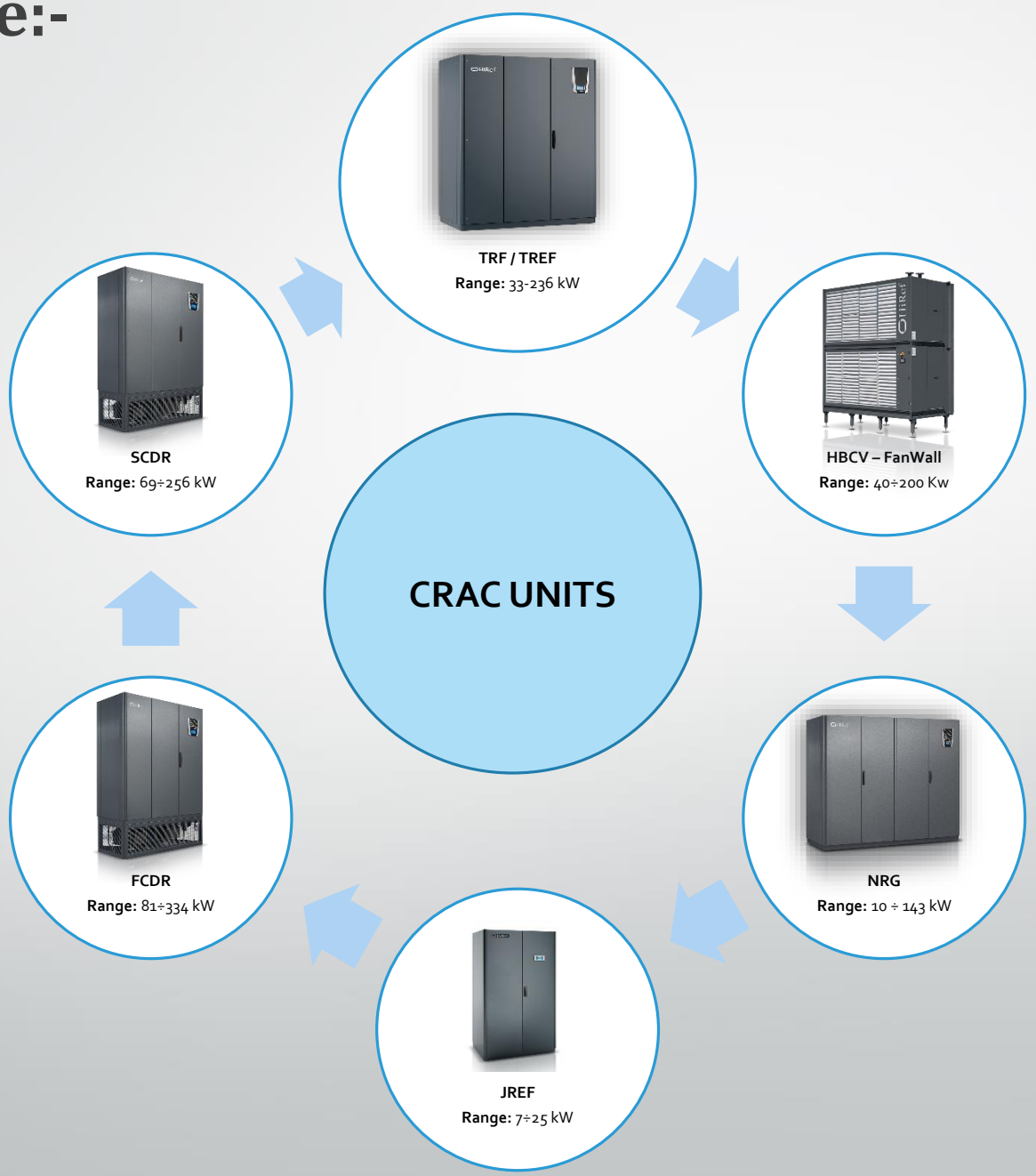
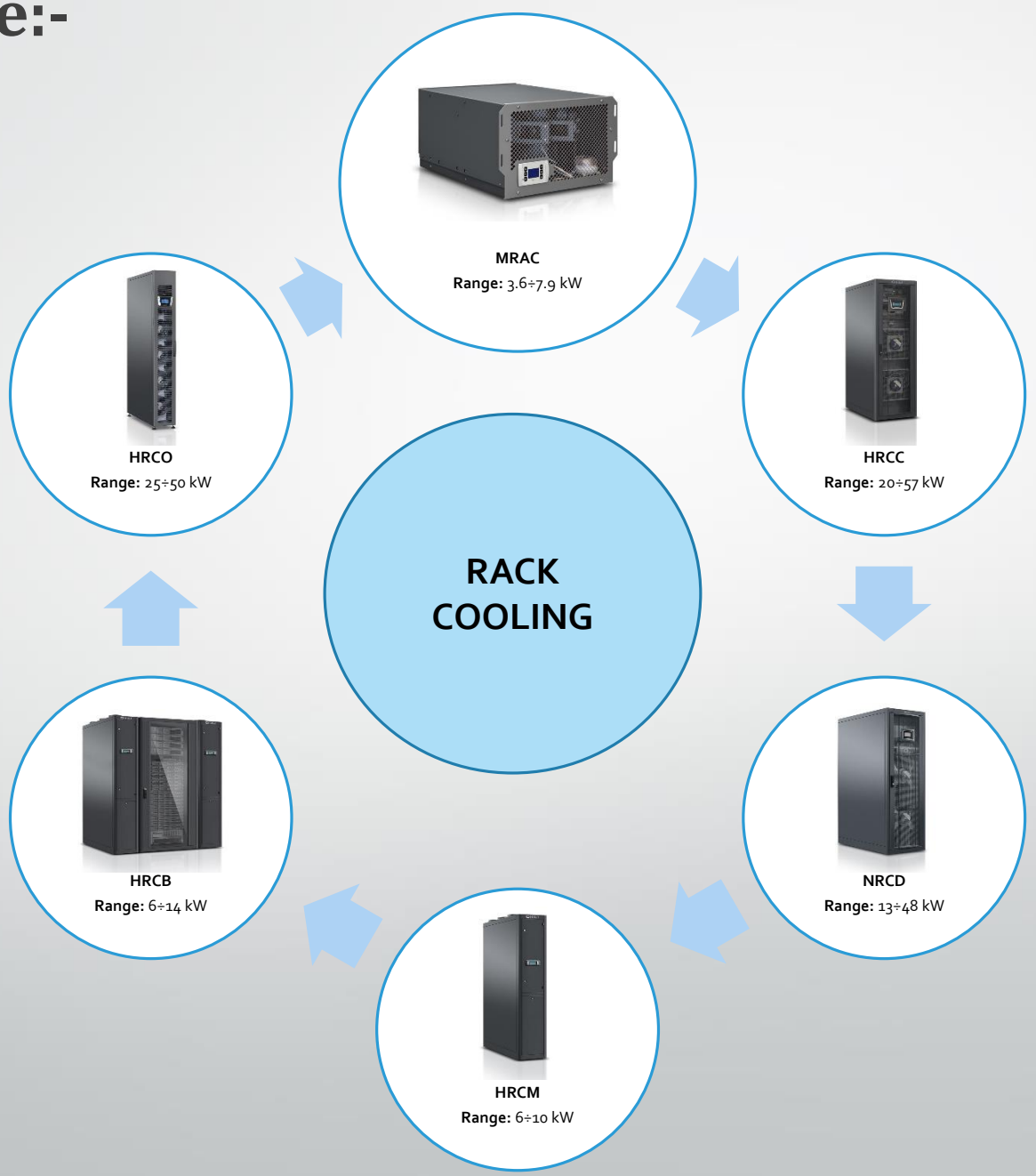
Closed Control Units

Product Range:-



Product Range:-



Adiabatic Cooling Solutions

Perimeter-mounted air conditioning units - TRF

- Range: 22 - 236 kW
- Suitable for Chilled Water, DX, Dual-Cooling and Free Cooling options
- Upflow and downflow options available.
- Particularly suitable for technological facilities that require constant temperature and airflow control.
- A larger finned pack exchanger consisting of coils with hydrophilic coating
- Air filter is positioned parallel to the coil and has the same surface area: this considerably reduces pressure drops in the air flowing through and, therefore, fan power absorption.
- Use of EC plug fans lets users adopt different adjustment logics (air flow, overpressure, constant DTs)
- The 'emergency speed' function ensures fan continuity even in the event of microprocessor malfunctions.
- Available in Three different heat exchanger types, each optimized on a specific water ΔT (incoming/outgoing water temperature difference), ensure outstandingly flexible adaptation to the system or liquid chillers already in operation, without compromising cooling performance:
  1. Geometry "A" for ΔT = 5°C
  2. Geometry "B" for ΔT = 8°C
  3. Geometry "C" for ΔT = 12°C

- Easier routine maintenance.

Fan Wall air conditioning units -HBCV

- Range: 40 - 200 kW
- These are designed for high density, hyper scale type technological environments where compact footprint is required without any impact on cooling capacity.
- Large surface area of Finned pack exchanger with hydrophilic coating minimizes the approach temperature between inlet air and outlet water, maximizing system efficiency.
- EC fans used for ventilation
- Each FanWall is scalable in width to adapt to the system specifications and can be configured as a single or double module.
- FanWall range features different types of standard exchanger depending on the temperature conditions of the water circuit.
  1. Geometry "B" for ΔT = 8°C
  2. Geometry "C" for ΔT = 12°C
- A fully redundant refrigeration circuit can be used: **double coil and double water adjustment valve** allow the server room to be cooled even in the event of either circuit failure.
- *Pressure independent control valves (PICV)* can be fitted on request for adjustment of the delivery flow rate to the units.
- No raised floors.

CRAC units with Fixed Speed/BLDC compressors

NRG:-

- Range: 10 - 143 kW
- Designed for IT facilities with variable load and continuous operation.
- Inverter-operated BLDC compressors.
- EC fans for ventilation.
- Heat exchange coils with hydrophilic coating of the fins
- Suitable for Chilled Water, DX, Dual-Cooling and Free Cooling options
- In periods when the outdoor air is cooler than the warm air in the Data Center, the external Dry-Cooler, normally used for condensation of the unit's refrigerating circuit, is exploited to generate effective cooling. A second heat exchange coil, positioned in series on the air flow with respect to the DX evaporator, is, in fact, fed with the cold air produced by the Dry-Cooler and provides a part of or 100% of the required cooling capacity.

JREF:-

- Range: 7 – 131 kW
- Suitable for Chilled Water, DX, Dual-Cooling and Free Cooling options
- Facilities requiring a constant cooling load.
- Lower foot-print

CRAC units with Underfloor fans - FCDR / SCDR

FCDR:-

- Range: 81 - 334 kW
- These are designed for high density and hyper scale type technological environments.
- EC fans used for ventilation.
- "E-Wing" profile separates the airflows coming from each fan
- Backward curved blade fans with EC motors and plastic impeller
- Ultra-low thermal approaches between chilled water and air increase the scope for using indirect Free-Cooling.
- Height-adjustable legs

SCDR:-

- Range: 69 - 256 kW
- High efficiency units
- Low footprint and compact design
- Backward curved blade fans with EC motors and plastic impeller

Rack Coolers – MRAC / NRCD

MRAC:-

- Range: 3.6 - 7.9 kW
- An ideal solution for cooling 19" racks as it takes up the space of only 7 racks.
- They come in a split configuration with an BLDC modulating compressor and it is possible to use a version with two outdoor moto condensing units to maximize unit redundancy
- EC fans for ventilation and coil with high efficiency fins with hydrophilic coating and aluminum structure version for low outdoor temperatures.
- Fully insulated paneling with G3 air filter

NRCD/V:-

- Range: 13 – 48 kW.
- Depending on how rack cooling is done - by creating hot and cold aisles in the Data Center or via compartmentalization and localized cooling.
- The NRCD range is available in two different configurations: - the "In Rack" configuration in which a closed circuit between rack cooler and rack is created; -the "In Row" configuration in which cold air is released into the cold aisle towards each rack and the warm air is drawn from the rack cooler in the "hot aisle".
- High performance BLDC Twin Rotary compressors.

Rack Coolers – HRCM / HRCB / HRCO

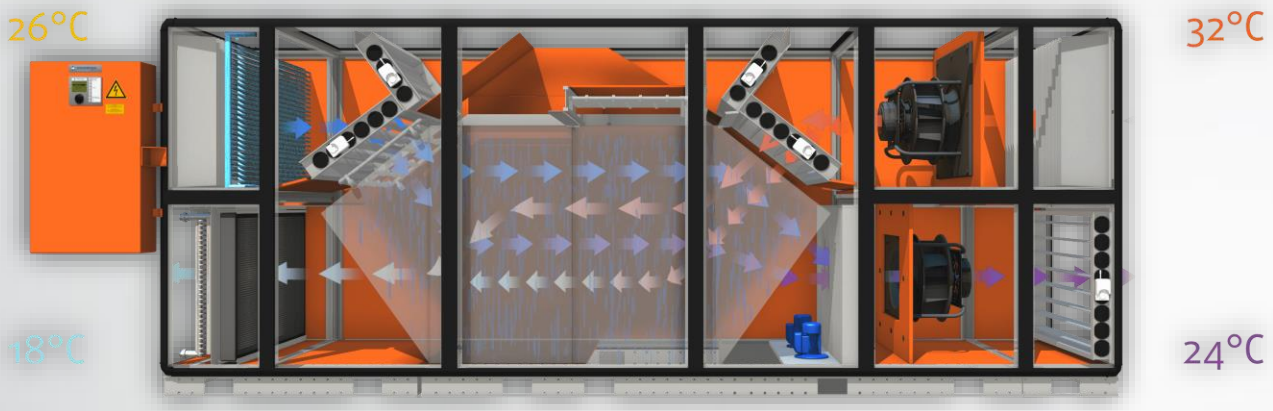
HRCM / HRCB:-

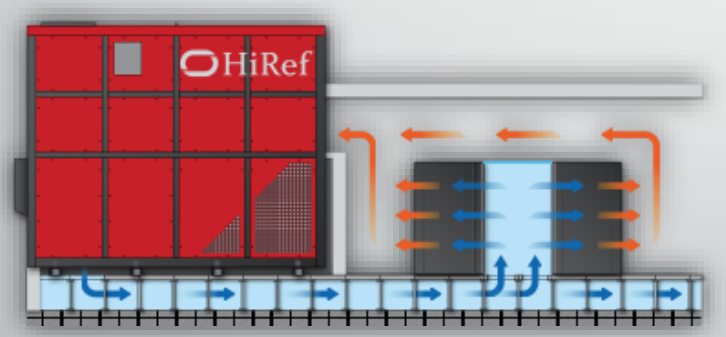
- Range: 6 – 14 kW
- Construction with the condensing section on board the machine considerably reduces installation costs as there are no refrigerating lines.
- The flanges on the condensing air ducts are located on the top of the unit, making installation tasks even easier.
- The aluminum fins of the evaporating coil are treated with a hydrophilic coating.
- The fans use EC brushless motors on both the evaporating and condensing sides.
- The range is also available in a version for low outdoor temperatures (-40 °C).
- Condensate discharge pump as standard.

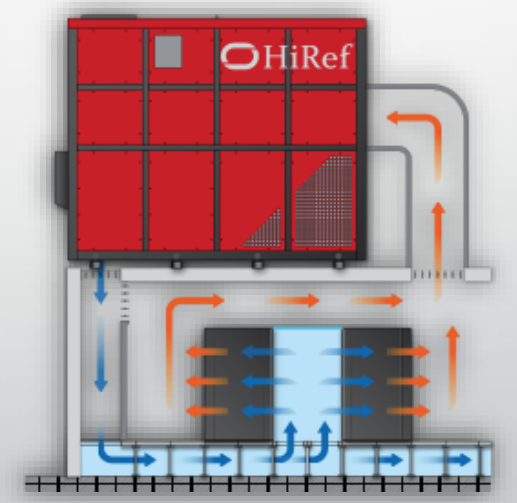
HRCO:-

- Range: 25– 50 kW
- The use of the ecological refrigerant R744 as a heat transfer fluid makes these units suitable for server room applications with high safety and reliability requirements.

Adiabatic Cooling

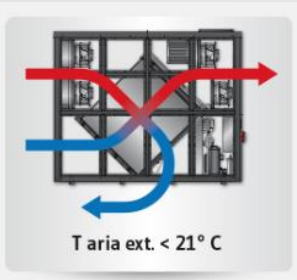




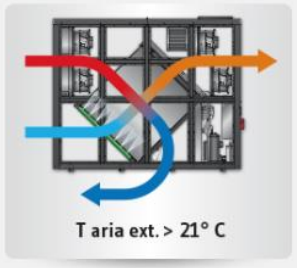


- Data Centre's require correct ambient temperature and relative humidity levels.
- Power Consumption by the cooling system accounts for a significant share of operation cost of the Data Centre
- Adiabatic Cooling works on the principle that Air can absorb a certain amount of water vapor to reach saturation.
- Water is Sprayed directly towards the cooling airflow, which causes the air to evaporate.

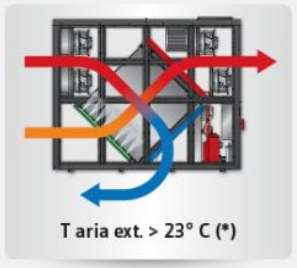
Adiabatic Cooling



FREE COOLING



EVAPORATIVE COOLING



COMBINAZIONE CON FUNZIONAMENTO MECCANICO

- Free Cooling – Heat exchange occurs only through the Air-to-Air cross flow heat exchanger.

- Evaporative Cooling - Water is injected directly into the cold airflow to reduce the cooling load.
- Adiabatic Cooling - Indirect Free-Cooling + Evaporative Cooling

- Mechanical Cooling - Cooling is done with the help of a refrigerating circuit and modulating BLDC compressors.
- Twofold benefit:
    1) The reduction of running costs
    2) The reduction of implementation costs thanks to lower installed electrical powers.

Adiabatic Cooling – Energy Analysis

- **Case 0**: 4 Free-Cooling chillers producing water at 10-16 °C serving 8 Close Control units;
- **Case 1**: 4 Free-Cooling chillers producing water at 21-32 °C serving 8 Close Control units;
- **Case 2***: 6 units with DATABATIC air-side indirect Free-Cooling and Adiabatic Cooling, $T_{delivery}$ = 27 °C;
- **Case 2****: 6 units with DATABATIC air-side indirect Free-Cooling and Adiabatic Cooling, $T_{delivery}$ = 30.5 °C;
- **Case 3**: 4 AIRBATIC evaporative adiabatic chillers serving 8 Close Control units.

For each configuration reference was made to a N+2 redundancy pattern (2 redundant units), keeping all the machines partially operational so that high efficiency point operation is ensured.

- Analysis was carried out in two Data Centre's located in Frankfurt and London.
- Cooling requirement – 500 kW
- Ambient conditions – 36 Deg. C – 25%, Delivery Air Temp. – 24 Deg. C

Adiabatic Cooling – Energy Analysis

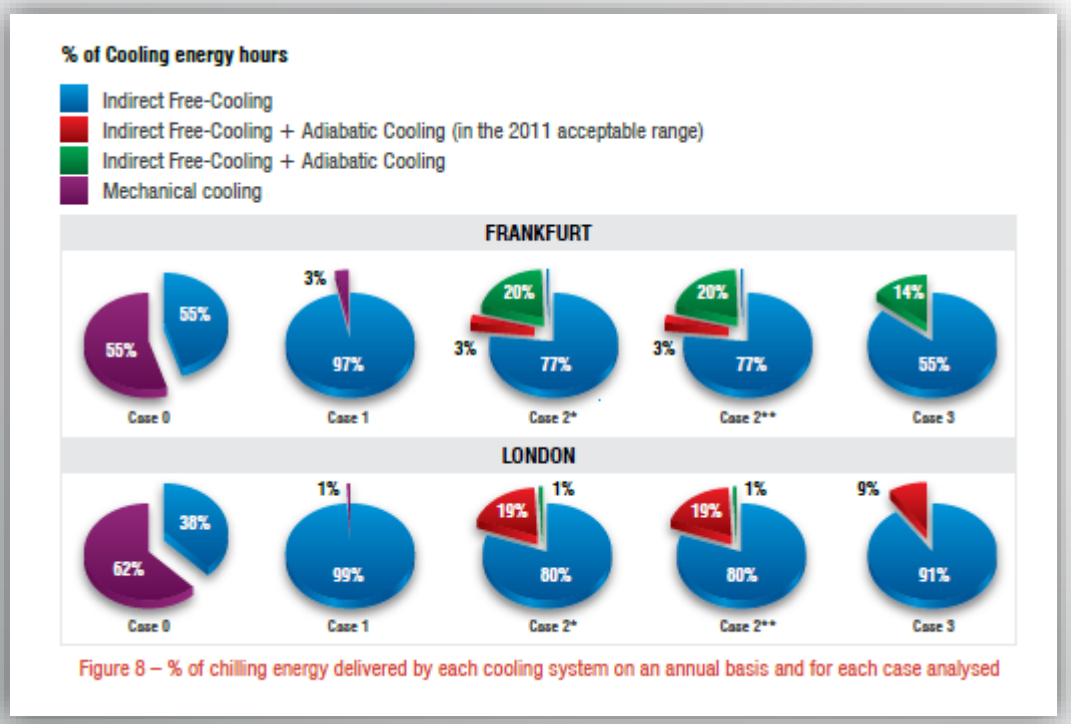


Figure 8 – % of chilling energy delivered by each cooling system on an annual basis and for each case analysed

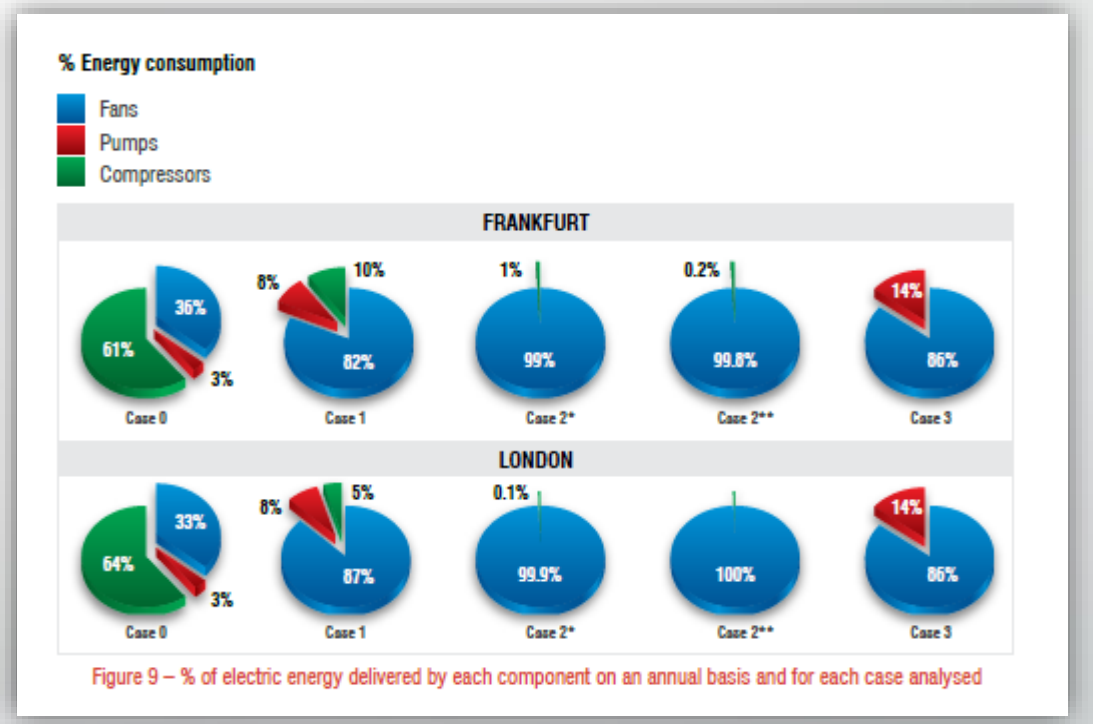
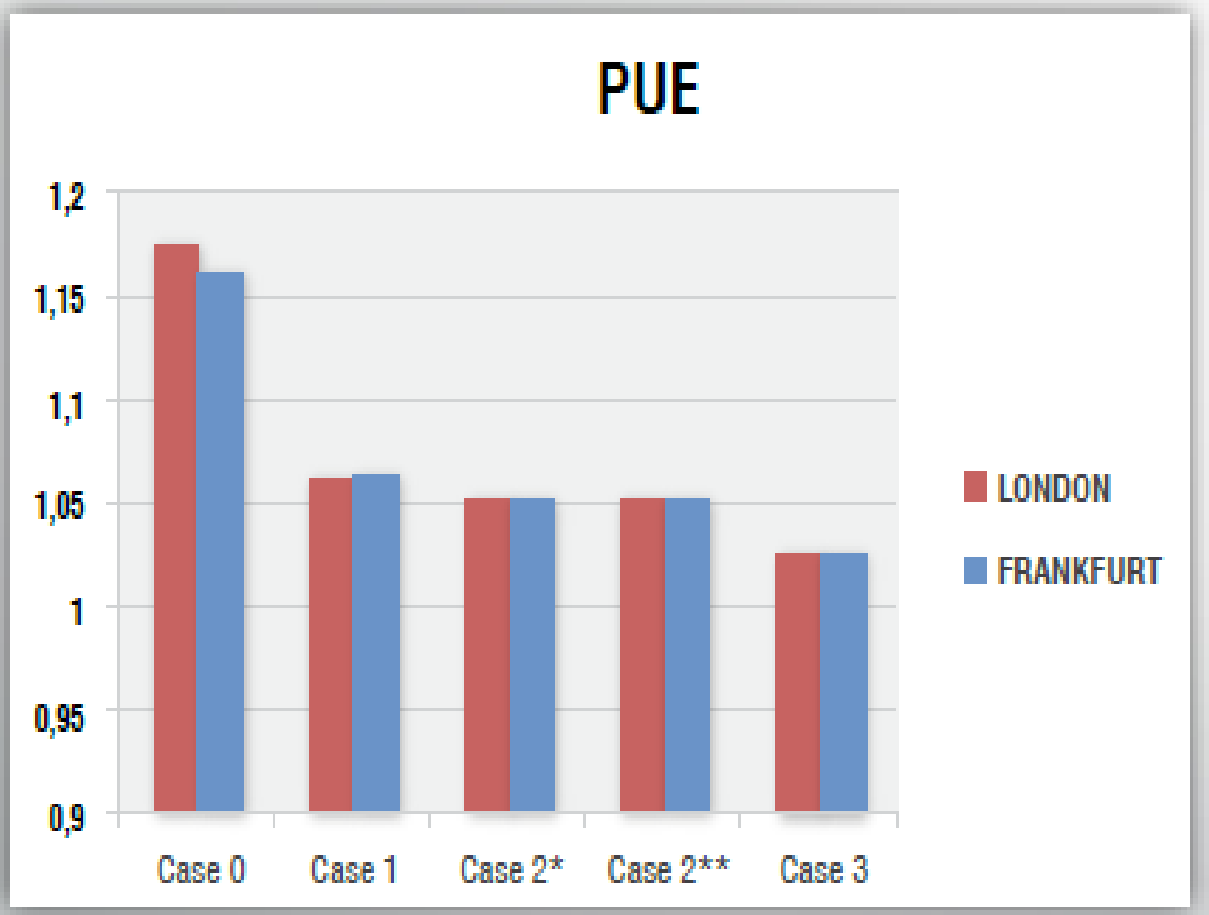


Figure 9 – % of electric energy delivered by each component on an annual basis and for each case analysed

Adiabatic Cooling – Energy Analysis



- Power Usage Effectiveness (PUE) is a metric representing the ratio of total amount of energy used by a computer data center facility to the energy delivered to computing equipment. It is used to determine the energy efficiency of a data center.
- Calculating the PUE efficiency value for each configuration and comparing the different figures, it appears that at both locations, the systems using “Adiabatic” cooling are the most efficient on a yearly basis and with a rated load.

Co-operation with Universities & Research Projects:-

Product Certifications:-

- CE – certificate for all HiRef products.
- 97/23 PED EC-Directive
- ISO 9001:2000 Quality Assurance by TUV Thüringen
- EAC certificate – for Custom Union

Project References:- Sultanate of Oman

Azaiba Plaza - Sohar

Project References:- Kingdom of Saudi Arabia

Fadhili Gas Plant

Jizan Gas Plant

Project References:- Kingdom of Saudi Arabia

Derayah DC

Jizan DC

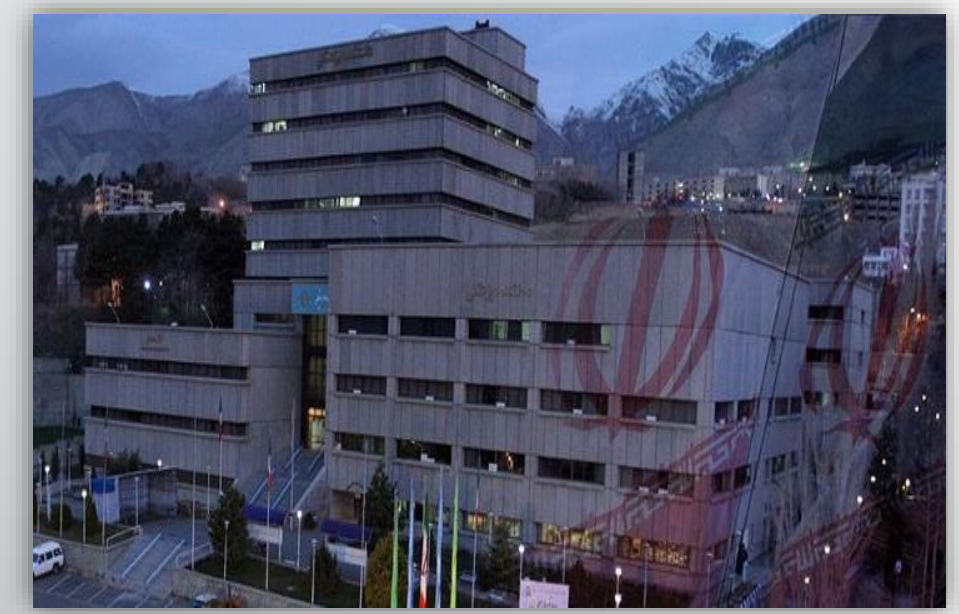
Project References:- Bahrain

Aluminium Bahrain (Alba)

Project References:- United Arab Emirates

Abu Dhabi Fish Market

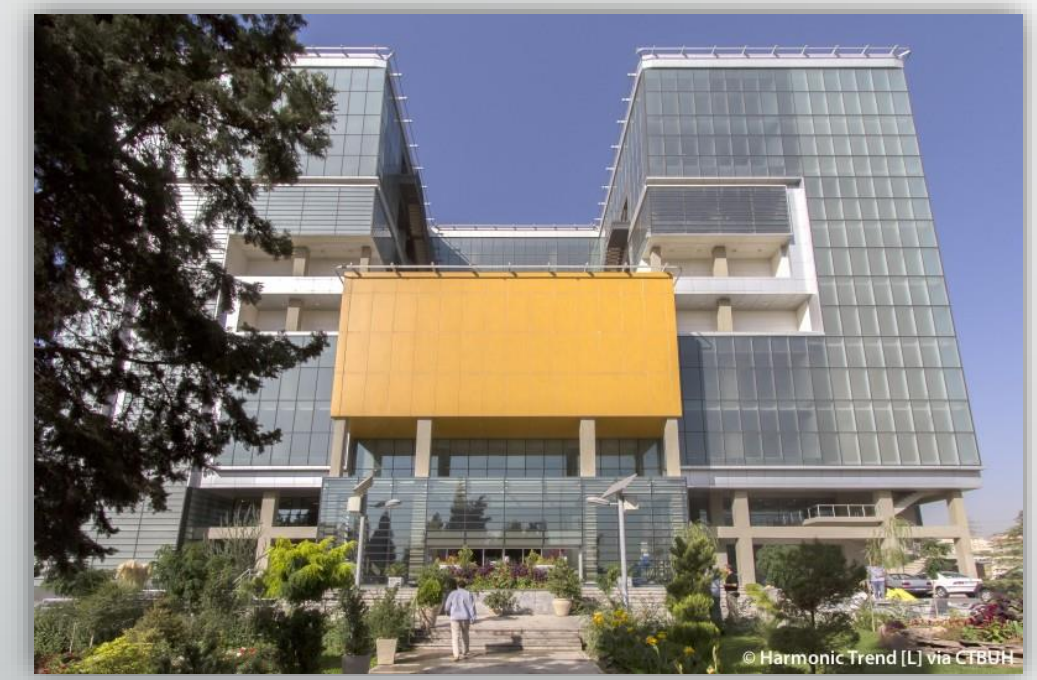
Project References:- Iran



Shahid Beheshti University - Genetic Faculty

Noor Bank

Project References:- Iran



ITC telecommunication center

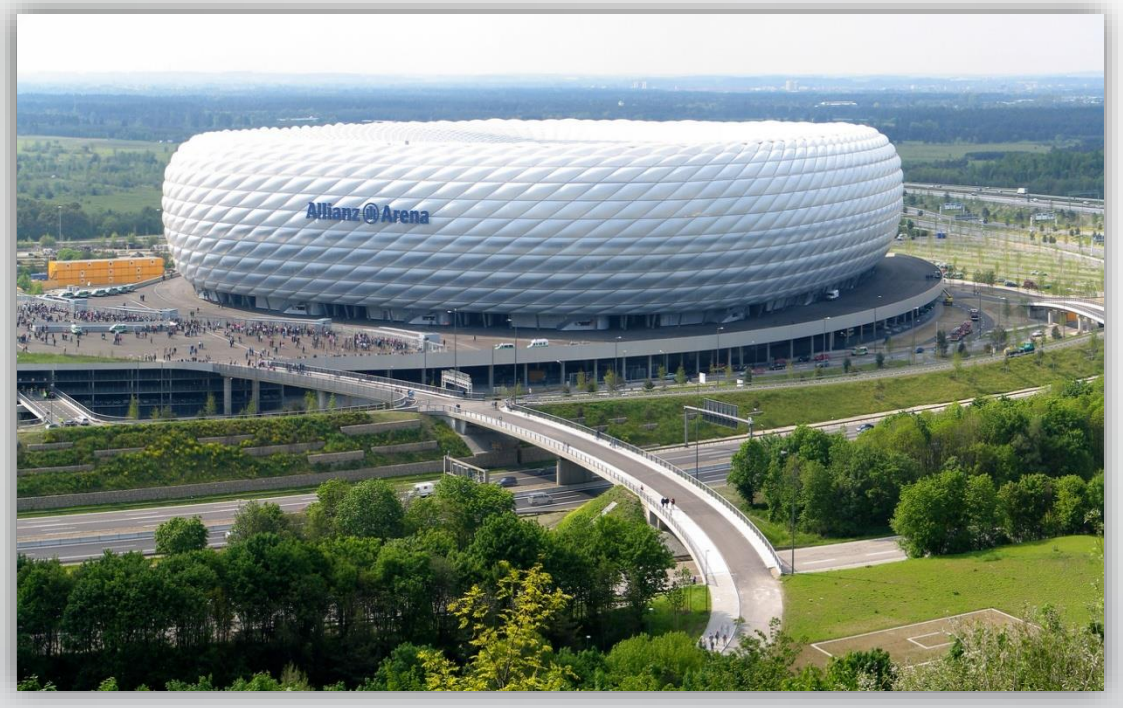
Imam Sadeq University

Project References:- Switzerland

T - Mobile

Neues Football Stadium

Project References:- München - D



ALLIANZ ARENA

Project References:- Zürich - CH

Universität Zürich

Project References:- Belgium

Fortis Bank

Proximus Mobile

Project References:- Germany

PUMA New Media Centre

MEDICAL UNIVERSITY DRESDEN

Project References:- Germany

BMW

SIEMENS