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Refrigeration2030 event provided insights into the future of Process Cooling and Food Cold Chain technologies

Leading sector representatives entered vivid discussions on which way to go

On Wednesday, 17 May 2016, Eurovent and Uniclimate jointly organised their Refrigeration2030 event in Paris. The event provided an interactive forum for close to 70 high-ranking sector representatives to discuss trends and developments in Industrial and Commercial Refrigeration, Process Cooling and Food Cold Chain. Vivid discussions took place on issues such as refrigerants of the future, the latest evaporative cooling technologies, and new, innovative solutions for the 2030 supermarket. A reflection ...

Opening remarks

In his welcome remarks, Mr Jean Paul Ouin (Secretary General, Uniclimate), remarked: 'There is no future without innovation. Uniclimate members have always been at the forefront of sustainability and innovative approaches. 2030 challenges are on the radar of Uniclimate members. They are putting in place large efforts to cope with upcoming challenges'.

Mr Karsten Fuchs (Vice-President, Eurovent Association) continued: 'It is time to have look at the future of our industry. It is time to reflect upon the future evolutions of our products. Is our industry ready for future challenges and market developments? Do we want to be trend-setters or followers? Are we 2030-ready?'.

Morning session: The future of process cooling - new solutions for 2030

Dr Denis Clodic (President & Director, EREIE)

In his keynote speech, Dr Denis Clodic has elaborated on greenhouse gas policies and whether the European Union would enter the right path.

Key takeaways include:

- Europe is leading the HFC phase-down.
- The mixture of R 32 and HFO of a GWP less than 150 would be used for replacing R404A and R22.
- Commercial refrigeration looks into a natural future, with CO2 becoming the most used refrigerant for this type of applications.

Mr Laurent Petiot (Sales Director, JACIR / Chairman of the Eurovent Product Group 'Evaporative Cooling Equipment')

Mr Laurent Petiot has widely elaborated on the benefits of applying evaporative cooling technologies. He has outlined how it would be possible to significantly increase the performances of a refrigeration system by using state-of-the-art evaporative solutions.

Key takeaways include:

- The efficiency of an evaporative cooling system, according to the recently published Eurovent Recommendation 9/12- 2016, is not just the electrical efficiency of the fan installed. In fact, the

efficiency of an evaporative cooling system largely depends on the evaporation of water caused by the effective mixing of water and air.

- The cooling tower industry already applies IE4 (Super Premium Efficiency) electrical motors.
- Evaporative cooling technologies are reliable, efficient and applicable everywhere in the world.
- The evaporative cooling industry is working hard in order to ensure a European-wide level-playing-field.

Mr Pierre Crevat (Regulatory Affairs Manager, UTC CCS)

Mr Pierre Crevat has outlined key factors necessary to achieve higher product efficiencies, including the example of re-using waste heat rejected by a process cooling.

Key takeaways include:

- The efficiency of an air or a water-cooled system must not be calculated at the design point, but on a seasonal basis (seasonal efficiency).
- The Total Cost of Ownership (TCO) is composed of capital costs, maintenance costs, end of life costs, and energy costs.
- The energy costs account up to the 75% of the TCO.
- Remote monitoring technologies play a fundamental role in reducing the energy consumption of a refrigeration system.

Mr Yann Quiquenpois (Senior Manager Applied & Refrigeration, Daikin France)

Mr Yann Quiquenpois has shown ways to reduce the CO₂ emissions of a refrigeration process by using reliable and efficient technologies. He stressed Daikin's efforts to tackle the reduction of CO₂ emissions.

Key takeaways include:

- The integration of refrigeration and heating systems is going to be a must for stores of a sales area not exceeding 1000m².
- State-of-the-art-solutions can reduce the CO₂ emissions up to about 46% compared to the ones of conventional solutions (i.e. R404A solutions).
- Existing installations can be easily retrofitted with F-Gas-ready solutions while keeping the system's efficiency at the same level as with refrigerants phased out by the F-Gas Regulation.

Panel discussion

A vivid discussion, moderated by Mr Thomas Michineau (Director Testing and Expertise, Cemafruid), took place at the end of the morning session. It was summarised that the process cooling industry would be on the right path: High-GWP refrigerants are being phased out, sustainable solutions are on the manufacturer's radar, and a possible cooperation between the evaporative cooling and commercial refrigeration industry could be observed.

Afternoon session: 2030 solutions for supermarkets

The afternoon session was moderated by Mr Francesco Scuderi (Refrigeration expert, Eurovent Association). In his introductory speech, Mr Scuderi stated: 'To be F-Gas or Ecodesign compliant is a must and out of debate. We should think ahead. The commercial refrigeration industry has always been characterised by a green and innovative thinking. R&D departments are working very hard on new solutions, which enable a sustainable and reliable growth.'

Mr Francesco Mastrapasqua (Refrigeration Systems Sales & Marketing Manager, Epta)

Mr Francesco Mastrapasqua has elaborated on the role of the industry for Epta: 'To make new technologies available while breaking down barriers'. That said, Mastrapasqua introduced a forward-thinking and market-ready CO₂ system, applicable everywhere in the world, which combines efficiency, energy saving and reliability in a simple design. His speech has provided an insight analysis on how to achieve the highest efficiency in a supermarket refrigeration system.

Key takeaways include:

- Overfeeding the evaporators is a key factor for achieving higher evaporation temperature, which means the highest energy saving and efficiency.
- A supermarket's efficiency must not be calculated at the design point, but on a seasonal basis (seasonal efficiency).
- CO₂ solutions are available for all markets, and all climates.
- The CO₂ equatorial line does not exist any longer.

Mr Frédéric Guy (Technical Support Manager, Tecumseh)

Mr Guy Frederic has elaborated on Tecumseh's product development approach. According to him, the regulatory boundaries must not be seen as constraints, but external stimuli to further innovate. He highlighted how Tecumseh would have the EU F-Gas Regulation as a driver to develop new low-GWP solutions.

Key takeaways include:

- The EN378-1:2016 allows the use of flammable refrigerants up to a charge of 1,7 kg (for sealed systems).
- Propane is becoming the most used refrigerants for commercial beverage coolers.
- Propane-based solutions can reduce the energy consumption up to about 19% compared to the R404a standard solutions.

Mr Karsten Fuchs (Director Market Segment VAC, ebm-papst / Eurovent Vice-President)

Mr Karsten Fuchs has put a key focus of his seminar on the terminal units of a supermarket system – the refrigerated display cabinets. He explained how state-of-the-art fans can be individually addressed by a bus system as well as individually and remotely monitored. Fuchs provided an example of a system integration, which can lead to even more energy savings, more precise control possibilities, and completely new ways of monitoring. The solution presented showcased an innovation breakthrough with a new business model of maintenance becoming a market-ready solution.

Key takeaways include:

- Individual speed adjustment of fans provides a better temperature distribution within the refrigerated display cabinet and increases its thermal performances.
- Fans continuous speed adjustment reduces the fan noise while increasing energy savings.
- Fan Modbus remote monitoring reduces the risk of system fault (by doing so, it reduces the amount of food waste).
- IoT is going to take on a leading role in the commercial refrigeration arena.

Mr Pontus Grimberg (International Sales Director, Frico)

Mr Pontus Grimberg outlined how it would be possible to save energy in a cold warehouses or supermarket cold rooms by using technologically advanced air curtains. Energy saving, food safety, and hygiene are key tasks of this type of air curtain equipment. Through state-of-the-art air curtain solutions, it would be possible to achieve these goals while reducing food waste at the same time.

Key takeaways include:

- The use of air-curtains in cold warehouses or cold rooms reduces cold losses and the number of defrosts per day – thus, the energy saving increases accordingly. It also brings the average temperature of a cold room close to the design one.
- Only air curtains tested and optimised according to the ISO 27327-1 can provide a homogeneous air beam.
- Electronically commutated motors with tangential impellers can reduce the air curtain's energy consumption up to about 80% compared to standard AC radial fan solutions.

Mr Franck Charton (CEO, French Retailers Association Perifem)

At last, Mr Franck Charton has provided insights into the 2030 supermarket. He has elaborated on ongoing trends in France. According to him, France tends to be a trend-setter in the commercial refrigeration arena.

Key takeaways include:

- The overall store dimensions are decreasing while fresh products areas are increasing.
- The number of water loop systems installed in France is significantly increasing.
- CO₂ and Propane would take on a leading role in new installations.
- The French Ministry of Interior is going to publish its own decree to increase the charge of flammable refrigerants up to 1,5 kg per circuit.

Refrigeration2030 key takeaways

- The European Union is leading the HFC phase-down.
- European Regulations (F-Gas and Ecodesign) constitute a driver to further innovate and to develop new low-GWP, highly efficient solutions while enabling a sustainable and reliable growth.
- The efficiency of both process cooling and commercial refrigeration systems should be calculated only on a seasonal basis and not at the design point.
- The CO₂ equatorial line is moving significantly down. It seems to not exist any longer as new technologies enable CO₂ applications in all climates.
- Evaporative cooling systems allow for high energy saving
- The 2030 supermarket will be based on natural refrigerants, remotely controlled and adjustable, and a place where cooling and heating systems are fully integrated with each other, a supermarket which will not waste food anymore
- The industry is entering the right path. It is ready for future challenges.

Related documents and links

All event presentations are now available on [Refrigeration2030 event page](#) on the Eurovent website.