



# Internasjonale nyheter Nr 26

## United States:

### Heat Pump demand increases & manufacturers respond one after another

Heat pumps are top-rated in Japan, Europe, and China, but they are relatively unfamiliar to American consumers. What is very exciting is that since last year, the use of air-to-air, air-to-water, and other heat pump equipment in the US market has rapidly increased in domestic, commercial, and industrial applications. The main reason is one is a shift towards electrification and away from fossil fuels. Many cold-weather states are promoting greenhouse gas emission reduction policies to provide positive incentives for heat pumps. Some regional energy efficiency organizations also promote heat pumps in colder climates. For example, Maine recently issued a 2020 Climate Action Plan, which aims to install heat pumps in 48% of the housing market by 2030, and several other states are following suit. Asian manufacturers are very optimistic about the commercial prospects in this field and have begun to accelerate the expansion of the heat pump market in the United States.

### Daikin extends heat pump range for boiler replacement

Daikin Europe launches the Daikin Altherma 3 H MT, a mid-temperature hydrosplit heat pump providing a brand-new solution to re-place polluting boilers in recently built houses. This extension of Daikin's existing heat pump range fits in perfectly with Daikin's mission to help decarbonize Europe and its vision to install a heat pump in every European home. The Daikin Altherma 3 H MT, more silent and better performing than ever, is the result of a unique collaboration between Daikin Europe and Daikin Japan.



As a true advocate of decarbonization, Daikin envisions a heat pump in every home, to fully replace boilers. Daikin therefore wants to extend its existing heat pump range for boiler renovation. With the Daikin Altherma 3 H MT, Daikin is further responding to this mission by providing a new solution to replace gas boilers in houses built after 1990.

### The 10th International Conference CO<sub>2</sub> and Ammonia Refrigeration Technologies in Ohrid 2023

The International Institute of Refrigeration has approved the next 10th International Conference CO<sub>2</sub> and Ammonia Refrigeration Technologies that will be held on April 27-29, 2023 in Ohrid, R. Macedonia. Although it is too early, please take into account the date of conference event. Information for stages of preparation and organization will be sent later, for the programme, committees and when the web site will be prepared. Please spread this information to the members and other interesting people of your organization / institution and place it in the calendar of events.

## European market:

### Chinese manufacturers active:

Chinese manufacturers have performed more prominently in the European market and have become solid competitors for Japanese and Korean brands. The proportion of Chinese manufacturers' brands has also increased. Statistics show that China's exports of air conditioners to Europe from January to September increased by 15 %. Among them, the export volume of mini-split ACs increased by 29 %. In addition to Russia, southern European countries such as Italy and Spain, are the countries where Chinese brands have achieved the greatest penetration. These regions are familiar with Chinese mobile phones and white goods, and the penetration of Chinese air-conditioning manufacturers entering this region has been smoother. The top Chinese manufacturers exporting to Europe are Midea, Gree, TCL, Hisense, Haier.



### Powering ahead to Chillventa 2022

#### Nuremberg from 11 to 13 October 2022

Following the fantastic success of the European Heat Pump Summit this year, preparations for Chillventa 2022 are in full swing. "The European Heat Pump Summit has shown how important it is to meet one another in person again. Buoyed by this positive momentum, we are starting the 2022 round of Chillventa with a spring in our steps," says Daniela Heinkel, Director of Chillventa. The world's leading exhibition for refrigeration technology will take place live on site in Nuremberg from 11 to 13 October 2022, when the international refrigeration, AC, ventilation and heat pump community will come together again to network in person, discover innovations, and discuss the latest trends and future developments. As usual, the event will kick off the day before the exhibition with the high-calibre Chillventa Congress, which will deliver answers to the issues impacting the industry. Prospective exhibitors can already book their stands easily and conveniently online to be part of this highlight in the industry calendar.



### Europe chiller market - 2020

According to Eurovent Market Intelligence, the European chiller market in 2020 was negatively impacted by the pandemic, with an overall decrease of 5.9 % for chillers with capacities of more than 50 kW compared with 2019, approaching €1.29 billion (about US\$ 1.47 billion). Around 9% of the units sold went to data centers and as many to hospitals, the only two sectors recording strong growth in 2020.

## The 14th IEA Heat Pump Conference in Chicago

The theme 'Heat Pumps – Resilient and Efficient Chicago, from May 15th through May 18th in 2023

Take the opportunity to participate in the 14th IEA Heat Pump Conference in Chicago, Illinois, U.S. Discuss the latest technologies in heat pumping technologies, and exchange valuable knowledge in market, policy, and stand-



ards information on related technologies, gathered around the theme; Heat Pumps – Resilient and Efficient. Exhibitions will be held at the conference, to share products and technologies.

**About the conference** Clean, efficient, and reliable energy systems are essential to meeting basic needs for comfortable, secure, and environmentally friendly building environments; food processing, transport, and storage; and industrial processes. Many analysts estimate that it will not be possible to achieve long-term climate, security, and energy goals without increasing the use of renewable heating and cooling hand in hand with large-scale refurbishment and renovation of the world's existing buildings and industrial infrastructure. **Call for abstracts**

## The expansion of refrigeration applications of Thermal Energy Storage and PCMs

**13rd IIR Conference on Phase-Change Materials and Slurries for Refrigeration and Air Conditioning. Vicenza, Italy,**



Based on a selection of papers from two recent IIR conferences, overview of thermal energy storage and PCM applications in the fields of refrigerated transport, display cabinets, fishing vessels, food processing and air conditioning. During this conference, promising results were stressed in the following areas:

### Refrigerated display cabinets

According to Norwegian author *Jokiel M* et al, TES systems using PCMs can significantly reduce temperature variations in a display cabinet during loading of warm items, defrost cycles or power outages. This contributes to reduced loss in product quality and lessen food waste. With an increasing share of intermittent renewables in the power grid, PCM-enhanced systems benefit from low-cost electricity during periods with low demand. Stored excess cold can be later used during periods with high demand. A TES prototype was developed using water as PCM integrated in an evaporator. This system was experimentally compared to a reference case not using PCMs. The results show the potential for PCM-TES to consistently keep the cabinet air temperature low, thus prolonging shelf life and product quality. Once charged, PCM-TES systems provide cooling of the items for several hours after the main evaporator is deactivated.

### Fishing vessels

A paper by SINTEF researchers *Saeed M. Z.* et al investigates thermal storage integration with the refrigerated seawater (RSW) system of a fishing vessel. Various scenarios were investigated. The use of ice in chilling tanks as cold storage can complement the RSW system and reduce total chilling time. This was tested by the addition of 5 m<sup>3</sup> ice, which resulted in a reduced cooling time of 30 minutes. Design modifications in tanks were also introduced to assess the potential of built-in thermal storage. A concept for plug-in thermal storage was also designed, employing a PCM with a 4 °C phase change temperature. Results showed that 1 m<sup>3</sup> thermal energy storage could provide an average of 30 kWh for chilling fish during peak load.

### Air conditioning

Russian researchers *Egorova A. I.* et al, have studied the application of a TES system inserted after the evaporator – with a separator installed downstream – connected to the fluid line between the expansion valve and the evaporator. In the charging mode, the TES works out as an evaporator, the separator can be used as a normal liquid separator on the suction line. In the cooling mode with TES, the compressor is turned off, and the refrigerant is circulated by a pump. The refrigerant leaving the evaporator re-condenses in the TES due to its cold capacity. In this way, the thermal energy stored in TES is released directly into the evaporator by the refrigerant itself. The proposed configuration does not generate energy savings but reduces energy costs to 42 % of the cost without TES thanks to the transfer of the electricity consumed during the night period. The serial operation of TES and compressor allows reducing the required TES volume.

### Food processing

Researchers at NTNU *Selvnes A.* et al in Norway stressed at the *9th IIR Conference on Ammonia and CO<sub>2</sub> Refrigeration Technologies* that refrigeration demands in food processing plants can vary significantly over a week, depending on



production schedules. As a result, it is common to experience peaks of electricity consumption due to the operation of refrigeration equipment during the day. Integrating TES technology in the refrigeration system enables significant peak shaving, shifting the load from peak to off-peak hours. The paper presents the results obtained from an experimental study conducted on a novel plates-in-tank TES unit integrated into a pump-circulated CO<sub>2</sub> refrigeration system at -5°C for the chilling of food. The unit consists of a stack of pillow-plates fitted in a stainless-steel container filled with an organic PCM (melting point of -9°C). The refrigerant circulates through the channels inside each pillow-plate and evaporates and condenses during the charging and discharging process, respectively. The results show the feasibility of integrating a TES unit with PCM directly into the refrigerant circuit, employing a freezing/melting process of the PCM and an evaporation/condensation process of the refrigerant in the same heat exchanger. Papers summarized here can be downloaded in IIR FRIDOC database

### Middle East:

#### Freight rates are soaring, and manufacturers are helpless:

The cost of shipping to the Middle East has soared, leaving many manufacturers at a loss. Shipping freight from Asia to the Middle East has increased more than ten-fold, and the rate of increase is the highest in the world. The rise in cost has led to a rise in the average retail price of air conditioners, hindering consumption in the end market. In the Middle East last year, even though the pandemic was severe, demand increased. However, the Middle East market in 2021 is disappointing.

#### World chiller and Air-side equipment market – 2020

According to JARN's database, worldwide chiller demand in 2020 approached US\$ 8.08 billion, down 7.0 % compared with 2019. The major chiller markets are China, the United States, and Europe, accounting for 30.8, 15.7, and 18.2% of the world market, respectively. The demand for worldwide airside equipment decreased by 1.8 % from 2019 to US\$ 7.19 billion.

#### Assessing the market potential of industrial heat pumps in Europe

To address the lack of product development of high temperature heat pumps, a recent article provides manufacturers with an estimate of the industrial heat pump market potential in EU-28 in terms of cumulative heating capacity, number of units, typical sizing and temperature levels.

### Commission asks for feedback:

#### New calculation method for renewable cooling

Within the context of the targets set in the Renewable Energy Directive (RED II) for Member States to annually increase their share of renewable energy in heating & cooling, the European Commission has released a new draft Delegated Regulation proposing a new calculation methodology for accounting renewable energy in cooling & district cooling. Stakeholders can provide feedback through this link until 25 November 2021. Stakeholders can provide feedback through an open text with maximum 4.000 characters, with the option to add an attachment. Two documents have been released to provide feedback on:

- *Draft Delegated Regulation on Calculation Method for Accounting Renewable Energy in Cooling & District Cooling.*
- *Annex to the Delegated Regulation detailing the Calculation Method.*

#### Frigoblock wins European transport award for sustainability 2022 for its Electric FK25i refrigeration unit

Frigoblock, one of the leading manufacturers of transport refrigeration units in Europe and a brand of Thermo King®, was awarded the European Transport Award for Sustainability 2022 for its electric FK25i refrigeration unit. Frigoblock all-electric technology took the honours in the competition's cooling and heating category for its innovative design accommodating the requirements of battery-powered, electric trucks.

#### Halton nominated finalist for the Entrepreneur of the Year Award

Halton has been selected as finalist together with 9 Finnish companies for the finals of the Finnish EC Entrepreneur of the Year competition in 2021. Halton is a family-owned, global technology leader in indoor air solutions for demanding spaces. Halton's goal is to enable human well-being in these environments. Halton was founded in Finland in 1969. The company currently operates in more than 35 countries around the world and has more than 1,600 skilled and professional employees. Halton is headquartered in Helsinki and has production facilities in nine countries.

#### 'Bye-bye, gas: Why a heat pump should be your next boiler'



Heat pumps are the cheapest way to decarbonize heat for consumers; they are typically 12% cheaper than Hybrid heat pumps and 95% cheaper than hydrogen boilers, according to a new study released by BEUC. Because of the climate crisis, we must reconsider how we heat our homes, moving away from gas and towards more efficient alternatives. As we've seen in recent months, gas boilers, which are used by millions of people across Europe, pollute the environment and expose us to enormous price volatility. According to a new BEUC (European Consumer Organisation) study, heat pumps are the most cost-effective way for consumers to decarbonize their heating.

#### Release of IEA World energy outlook 2021



Solutions to reach Net Zero Emissions are available, cost-effective, and offer shelter for fossil fuel price shocks – *heat pumps are one of the highlighted examples*. This year's edition of the World Energy Outlook (WEO), released on October 13, 2021, has been designed, exceptionally, as a guidebook to COP26. It spells out clearly what is at stake – what the pledges to reduce emissions made by governments so far mean for the energy sector and the climate. And it makes clear what more needs to be done to move beyond these announced pledges towards a pathway that would have a good chance of limiting global warming to 1.5 °C and avoiding the worst effects of climate change.

#### AHR Expo returns to Las Vegas as an in-person event

The 2022 AHR Expo will be held at Las Vegas Convention Center in the United States, from January 31 to February 2, 2022. During the Expo, visitors will be able to meet the companies, engineers, and innovators who are inventing the future of HVAC&R. Manufacturers and suppliers from around the world will unveil the latest additions to their product lineups, demonstrate what is new and innovative about the technologies, provide technical support, and answer questions.

