Magnetic refrigeration: a promising technology


Despite some realizations at low temperatures, it seemed difficult to obtain good efficiency and reasonable costs at room temperature, for general refrigeration uses. However, this technology seemed environmentally friendly and several universities and private companies were interested in it. Around 40 prototypes have been built in America, Asia and Europe.

The development has entered a new phase. The IIR Working Party will set up comparison of calculation methods in order to enter a pre-industrialization era. Astronautics Corp. of America (a private company involved in our Working Party) received a USD 2.9 million energy research grant funded through a federal US agency. Another company, a start-up, at Cambridge University, UK, is involved, along with the IIR, in a European project (Frisbee). International recognition and true private investment have thus been achieved.

We can be proud of our previous work and confident in the future of this new technology.

For more information:

Companies sponsoring the 23rd International Congress of Refrigeration – under the patronage of the Ministry of Industry and Trade of the Czech Republic – are currently the following: Alfa Laval, Bock, Carrier, Cemafroid, Daikin, Emerson, EPEE, Eurammon, GEA, Ingersoll Rand, Johnson Controls, Prihoda and Sofrigam.

The 4th event on Ammonia Refrigeration Technology will take place in Ohrid, Macedonia, on April 14-16, 2011. Keynote presentations will be given by Andy Pearson, Anders Lindborg, Gary Webster, Pega Hrja and John Thome and the programme will cover many facets of ammonia technology. Present a paper and register: ristoci@ukim.edu.mk

Obituary

Professor Fredolino (Lino) Mattarolo, who died on Friday, September 17 at the age of 90, was not only a renowned scientist in Italy where he received the prestigious Premio cultura Città di Bassano in 2000, but was also highly thought of in the worldwide refrigeration community. He was President of the Scientific Committee of the IIR from 1975 until 1983, after having been Vice-President of Section B in 1972-1973 and President of Commission II in 1968-1975. He was the IIR’s Delegate of Italy from 1976 until 2004. Even once he had retired, he continued to take part in many IIR activities and his presence was always much appreciated, not only because of the value of his written works and presentations, but also because of his dedication and kindness. The IIR and the refrigeration community have lost one of their most eminent members. We have lost a friend. We will not forget him.

The IIR wishes to express its sympathy to the family and relatives of Mr Claude Ernst. For over 7 years, Mr Ernst took part in the selection and indexation of articles for the IIR’s Fridoc database. He understood several European languages, including English, German and Italian, also assisted us in translating their titles and abstracts. The IIR staff was happy to welcome him regularly at the IIR head office and appreciated him for his competence, his knowledge of refrigeration and his kindness. We will also remember him as a thorough man with a genuine interest in refrigeration, real teaching skills and always eager to give a helping hand and share his extensive knowledge. For all these reasons, we will miss him a lot.

Two IIR-co-sponsored events will be held in the near future:

- Cryomedicine 2010: the New State of the Art is to be held in Tokyo on November 11-13, 2010. The conference will deal with many facets of cryosurgery, vitrification and preservation. Check out the programme and register now: lowtemp37@med.toho-u.ac.jp
http://homepages2.nifty.com/cryomedicine/

- The 41 st International Conference on Heating, Air Conditioning and Refrigeration is to take place in Belgrade on December 1-3, 2010. Key themes include: zero-energy buildings; energy efficiency of buildings; environmentally friendly cooling systems; refrigerants; renewable energy sources. Register now! office@kgh-kongres.org
www.kgh-kongres.org/2010/eng

Two IIR events will be held in 2011 before the IIR Congress in Prague:

- Sources/Sinks alternative to outside Air for Heat Pump & AC Techniques + International Sorption Heat Pump Conference (ISHPC11) will be held as overlapping events in Padua, Italy, on April 5-8, 2011. The conference will bring together heat sink and heat source research, development, and expert and the latest types of heat pumping and refrigeration technologies. ISHPC with deal with heat pumping devices using ab- or adsorption effects. Send a paper and register:
info@aicarr.org www.aicarr.org/Pages/PadovalIIR2011/home.aspx

News from IIR members

The IIR welcomes the following new members:

Private members
Mr. Jon Douglas, U.S. 
Mr. Guy Albert Murat, Martine 
Mr. Sebastian Ott, Germany 
Mr. Pradeep Kumar Sahoo, India 
Mr. Ezio Vardanega, Italy

Junior members
Mr. Vincent Lemort, Belgium

Johnson Controls and Princess Noura bint Abdulrahman University are beating the record books with York CYK chillers. To construct what is claimed to be the world’s largest chiller plant using air-cooled radiators, Johnson Controls is providing 26 York CYK chillers to Princess Noura bint Abdulrahman University, Saudi Arabia, the largest women-only university in the world. Each high-lift chiller has a capacity of 7280 kW. The university campus will be 8 million m² in total, with approximately 3 million m³ of built-up area. The campus will include an administration building, a central library, conference centres, buildings for 15 faculties, several laboratories, and a state-of-the-art 700-bed hospital. Located in the arid climate of Riyadh, where water is scarce and very expensive, the university selected a cooling system design that will minimize water consumption. Compared to a plant that uses evaporative cooling towers, air-cooled radiators, that remove heat from the closed-loop, condenser-water circuit, will save an estimated 1 million litres of water per day of chiller operation.

http://yourenergyforum.com
www.constructionweekonline.com

Star Refrigeration just announced a new collaboration with Core Enterprises, an American portable instruments developer to distribute AccuTools® eL-720 carbon dioxide gas leak detector. The detector is easy to handle and effective at locating even the most difficult-to-find leaks. The lightweight (425 g) eL-720 detects concentrations of carbon dioxide gas as low as 400 ppm over ambient. In addition, it features automatic low power requirements, small size and high sensitivity making it a device that offers highly effective leak detection.

www.elearning-training.com/leakdetector.aspx

Solar hybrid air conditioner launched by LG
LG Electronics (LG) recently announced Korea’s first eco-friendly residential hybrid air conditioner that utilizes solar energy as part of its power supply. By combining power generated through the solar cell module attached to the top of the outdoor unit, this standing-style air conditioner (model F-Q232LASS) can produce up to 70W of power, providing enough energy to run the unit’s air purification process.

www.koreatimes.com
www.lg.com
In the news

Markets

A Japanese market research company has analysed the Japanese heat pump market for applications in Eco-Cute water heaters and air-conditioners and published a forecast for market development over the next 10 years. Growth expectations for the overall heat pump market are around 8.1% increase from a € 17.2 billion market in 2009 to a € 18.7 billion market by 2015. What are heat recovery heat pumps accounted in 2009 for a € 8.4 million market share. This share is expected to rise to € 29 million by 2015 to reach € 60.7 million by 2020 (622% increase from 2009). The market for commercial heat pump water heaters reached € 30.9 million in 2009. With increased deployment in industrial cleaning and sterilisation processes, this share is expected to rise to € 84.3 million by 2015 and to € 126.5 million by 2020 (309% increase from 2009). These predictions include both heat pumps using CO₂ as refrigerant and those using HFCs. Heat pumps in vending machines held a market share of € 459.1 million which is forecasted to increase to € 1.1 billion by 2015, then slightly decrease to € 984.5 billion (114% increase from 2009). Heat pumps can considerably improve the overall energy efficiency of vending machines.

The market for heat pumps in mobile air conditioning is expected to grow from € 310.3 million in 2009 to € 569.6 million by 2010, representing USD 8 billion and 300% growth in terms of units and a 400% increase in terms of value compared with 2009. Sales of air-conditioning units were expected to rise considerably in July-August. JARN, July 26, 2010

Cold chain news

India’s growing cold chain
With a 63.5-million-tonne annual production of fruit, 105-million-tonne annual production of milk, India is the largest fruit and milk producer in the world. It is also the second vegetable producer in the world with an annual production of 125.89 million tonnes. The approx. 2-billion € cold chain industry is growing at an annual rate of 20-25% and is expected to reach 6600 million € by 2015, but over 95% of the 230 million tonnes perishable foods are transported annually outside the cold chain. The refrigerated transport business is valued at 220 million €, and involves 25 000 vehicles, 80% of which transport milk, thereby leaving a mere 5000 vehicles for the transportation of all other categories of foods.

In 2009, the Indian Government unveiled plans to set up 350 food processing units and the Ministry of Food Processing Industries (MoFPI) said it was planning to invest 14 billion € in the sector by 2015, in a bid to create as many as 10 million new jobs, treble India’s food processing industry over the next five years and double its share of global trade to 3%. The policy involves attracting foreign investment. The government claims that direct foreign investment already plays an important role in developing the food processing sector and helped it increase by 175% from 2009-2010 to approx 205 million €. http://indiacoldchainexpo.com

Refrigerant news

Refrigerant shortage
The refrigeration sector is facing a shortage of R134a, employed as a refrigerant or as a component used in the making of R404A. This is due to several factors: a lack of raw materials, the stopping of production of factories in Asia, low investments in a refrigerant due to be phased out in mobile air-conditioning, reduced producers stocks after the economic depression, particularly in the automobile sector, and the high demand for HFCs in order to replace R22 since the ban on virgin HFCs from January 1, 2010. R404A also suffers from the shortage in some of its other components: R143a and R125. Prices of R125 have gone up by 95% since the beginning of the year and a 30% rise is expected for most R134a products over the next few weeks, while some specialists claim that both R125 and refrigerants in the 400 series could go up by up to 10% a month. There is also a potentially catastrophic R22 shortage, according to industry sources, as only reclaimed R22 is allowed in the EU and the return of R22 refrigerant suitable for reuse is too low to meet the demand of the still most widely used refrigerant gas.

www.racplus.com

General Motors has announced that it will convert by 2013 the air-conditioning systems in its entire fleet of Chevrolet, Cadillac, Buick and GMC models from R12 to R134a (GWP of 1300) to HFC-1234yf developed by Honeywell and DuPont (GWP of 4). GM said that the use of HFC-1234yf will help GM vehicles significantly exceed their targets under the EPA’s new motor vehicle greenhouse gas regulations which require an overall 40% improvement in overall US fleet average vehicle fuel economy by 2016.


The European Union has agreed to provide € 400 000 funding for a German information campaign on climate-friendly air-conditioning systems in cars. The campaign will be led by the environmental group Deutsche Umwelthilfe (DUH). “Pro Climate: efficient car air-conditioning systems with natural refrigerants” is the name of the 3-year campaign planned by DUH. The total cost of the campaign is expected to be € 800 000. The campaign will not only focus on the choice of refrigerant but will also touch upon the efficiency of car air-conditioning systems and fuel consumption. It will also advocate the use of innovative air-conditioning technologies. The EU LIFE+ Programme 2007-2013 succeeds the EU LIFE Programme which, since 1992, has been co-funded by the EU in the environmental sector. The share of the EU budget is currently 50% and the remaining 50% is contributed by national public and private sources

www.r404a.org

ASHRAE installed new officers and directors at its 2010 Annual Meeting held in Albuquerque, New Mexico, on June 26-30, 2010. Prof. Eckhard Groll (Purdue University) was installed as Director-at-Large to ASHRAE’s Board of Directors and will serve a 3-year (2010-2013). Eckhard Groll is Deputy Delegate of the USA to the IIR and President of the US National Committee for the IIR.

During the Purdue Conferences held on July 12-15, 2010, Prof. Clark Bullard of the University of Illinois in Urbana-Champaign received the Wilbur T. Pentzer Achievement and Leadership Award for outstanding contributions to the growth and well-being of the International Institute of Refrigeration (IIR) and the US National Committee of the IIR. Clark Bullard is Delegate of the USA to the IIR and is President of the IIR’s Commission B2 on Refrigerating equipment. https://engineering.purdue.edu
Refrigerant Management Canada (RMC) is fighting ozone depletion and global warming on two fronts: by collecting and destroying CFC and HCFC refrigerants and by launching and managing a programme governing HFC refrigerants. As part of the latter, the levy on HFCs was increased from CAD 1.50 to CAD 2.50 per kg as of January 1, 2010. RMC has collected and destroyed over 2 million kg of refrigerants over the 10-year period since it was set up.

www.refrigerantmanagement.ca

- UNEP has just published a Manual for the Refrigeration and Air-conditioning Technicians and Engineers: Post-phase-out period of CFCs and HCFCs and end of phase-out of HFCs, which “may be used for the purpose of developing training resources or parts of training courses, as well as general guidance and information for technicians on issues that are closely related to the use and application of alternative refrigerants.” www.unep.fr/ozonation/information/mmcfiles/7443-e-Ref_manual_servicing_technicians.pdf

- NVKL, the Dutch association of contractors, distributors and manufacturers, recently opened the first training centre of natural refrigerants in Europe. The new training centre is located in Ede, the Netherlands. It comprises: detection and security systems; CO2 pumping system with a cooling unit for CO2 as evaporating refrigerant; CO2 compression system of -30°C/8°C; NH3/CO2 cascade system; NH3/CO2 cascade condenser with capacity of 50 kW. www.r744.com

- WR Refrigeration has launched the European CO2 Refrigeration Training Academy in the UK in order to train engineers at their facility based on a mini-supermarket featuring refrigerated display cases, low-temperature display cases and a cold room. Over 200 engineers have already successfully completed the 2-day CO2 course. www.racplus.com

- Star Refrigeration has developed a CO2 refrigeration course comprising 2 modules. Thanks to the IIR-elearning-training partnership, IIR members from developing countries benefit from a 50% discount, while members from developed countries are entitled to a 10% discount.

www.elearning-training.com/C000152-C02RefrigerationCourse.aspx

Briefs

- The WMO-UNEP "Scientific Assessment of Ozone Depletion: 2010" launched on the International Day for the Preservation of the Ozone Layer (September 16) the Ninth Montreal Protocol contributions toward reducing global greenhouse gas emissions. It also assesses that "EESC" (equivalent effective stratospheric chlorine) at midlatitudes is projected to return to 1980 levels in 2046 for the baseline scenario, 2-3 years earlier than projected in the previous 2006 Assessment; this revision is primarily due to an improved understanding of lower stratospheric chlorine and bromine release from ozone-depleting substances (ODSs) along with contributions from smaller HFC emissions. Moreover, the sum of the HFCs currently used as ODS replacements contributes about 0.4 gigatonnes of CO2-equivalent per year to total global CO2-equivalent emissions, while the HFCs contribute about 0.7 gigatonnes. CO2-equivalent emissions of HFCs are increasing by about 8% per year and this rate is expected to continue to grow, while the contribution from HFCs is expected to start decreasing in the next decade." www.unep.ch/Ozone/Assessment_Panels/SAP/ExecutiveSummary_SAP_2010.pdf

- The Multilateral Fund for the implementation of the Montreal Protocol approved Japan's request for funding for the preparation of a project concerning the application of transcritical CO2 to ice-block manufacturing in Nigeria. The project will evaluate the technical and commercial viability of the use of CO2 as a refrigerant to replace HCFC-22 in split commercial refrigeration equipment, in particular at low temperatures (freezing).

www.r744.com

- The Australian Institute of Refrigeration, Air conditioning and Heating, AIRAH, is celebrating its 90th anniversary and is staging a conference, HVAC&R in the 21st Century, on November 18-19, 2010 in Sydney. www.airah.org.au

- The European Cold Storage and Logistics Association, ECSLA, is celebrating its 50th anniversary. The highlight will be a 2-day meeting and banquet on November 29-30, 2010 in Brussels, Belgium. europa.eu.int/ resides-in/ ecsc.be

- The next edition of the UK's RAC show is to be held in Birmingham on October 17-19, 2011, beside BEST, Interbuild Onsite and Glass.exe. The bi-annual RAC show formerly took place in March. www.best-show.co.uk

Out of the ordinary

- Green Acropolis in South Korea Rotterdam-based architects MVRDV has won the Gwanggyo City Centre Competition for their design of an incredible new city south of Seoul, South Korea. Envisioned as a verdant series of ‘hill’ structures, the “City of Green Rings” will be a self-sufficient city for up to 77 000 inhabitants comprising housing, offices, shops and educational facilities. Designed as a cluster of concentric rings, each floor in the city is lined with lush box hedges that improve ventilation and reduce energy and water usage. An internal irrigation system will store water from the buildings and use it to sustain the green facades. Development is to be completed in 2011 and construction expected to start shortly after.

http://vision4ourcities.com/blog/?p=320

www.mvr vd.nl

Technology

Sorption chillers

- Sorption chiller technology is rapidly developing, especially that using solar energy. As highlighted by Jakob and Kohlenbach during the latest IIR Gustav Lorentzen Conference on Natural Working Fluids in Sydney, European numerous new sorption chillers with small- and medium-scale cooling capacity – up to 500 kW – are now available on the market: 7 single-effect water/lithium bromide and 2 water-lithium chloride absorption chillers; 7 ammonia/water chillers as well as 2 water/silica gel and 2 water/zeolith adsorption chillers. The limiting potential factor for solar and thermal (district heat or waste heat from CHP units, biomass as well as processes) is very large, so various companies have developed complete solar cooling kits for the product business with specific costs between 3000 and 4500 €/kW cooling. Maximum operation time and low-cost driving heat are the key factors influencing the economic efficiency of thermal and solar cooling kits. A solar fraction of minimum 70% should be achieved in Europe to ensure economic operation. Of 400 solar cooling realized in Europe in 2008, about 60% use absorption chillers, 11% adsorption chillers and 29% open systems such as DEC (desiccant evaporative cooling) and liquid sorption systems.

- In Japan, Tokyo Gas, Osaka Gas and Toho Gas have developed a solar-assisted absorption chiller-heater. While preferentially utilizing solar heat, it can provide the cooling load required by automatically performing backup with gas combustion when the solar heat falls, thus maintaining the required capacity in a stable manner. It is claimed that a roughly 24% reduction in yearly primary energy consumption used for space cooling/heating can be achieved in comparison with the previous gas-air-conditioning system when installed in a 4000 m2 building. The new product makes it possible to maximize the amount of solar heat to be used since it can use even low-temperature solar heat thanks to a newly installed solar heat condenser and optimized cooling water path. It can also maximize the efficiency of the solar cooling system by computing the region of temperatures in which the solar heat is used which varies with the cooling load, and also by performing system control for using hot water taken out of the heat collector at the lowest possible temperature. It has a rated cooling COP higher than 1.3 (corresponding to the rated cooling COP of higher than 3.5 in the case of an electric system) when the system operates with gas alone.

- In China, absorption chillers from LS Mtron won the bid for the Chengdu Huirong international project, which is to be one of the 10 landmark buildings in Chengdu, with a total construction area of 150 000 m2. The total cooling capacity of the plant is 15.1 MW, claimed to be the largest absorption chiller project.


CHEs in heat pumps

- In its Annex 33, "Compact Heat Exchangers in Heat Pumping Equipment" issued in September 2010, the Heat Pump Programme details the benefits of using compact heat exchangers (CHEs):

- Improved heat exchanger thermal effectiveness: thermal effectiveness values in excess of 0.95 are economically possible with CHEs – up to 0.98 for printed circuit heat exchanger. This compares to typical values of 0.75 for shell-and-tube heat exchangers.
**R&D**

- The US Department of Energy’s National Renewable Energy Laboratory (NREL) has developed a new air-conditioning system combining membranes, evaporative coolers and heat pumps, in a single device with the objective to suit all climates, especially humid climates. The Desiccant-Enhanced eVaporative air conditioner (DEVap) cooling core uses water and liquid desiccant to draw in outside air, exhaust some of that air and return cool, dry air to the area being cooled. DEVap’s integrated evaporative component and its desiccant drying process offer improved durability by lowering corrosion costs and much lower energy usage. Evaporative coolers are a lower-cost alternative to AC in dry climates that don’t get too hot or humid. In humid climates, adding water to the air creates a hot and sticky building environment. Furthermore, the air cannot absorb enough water to become cold”, says E. Kozubal, co-inventor of DEVap. DEVap relies on the desiccant’s capacity to create dry air using heat evaporative coolers’ capacity to take dry air and make cold air. The desiccants NREL uses are highly concentrated aqueous solutions of lithium chloride or calcium chloride. They have a high affinity for water vapor and can thus create very dry air. The thin membranes used are hydrophobic, which means water tends to bead up rather than soak through the membranes. That property keeps the water and the desiccant separated from the air stream. DEVap is claimed to use 50 to 90% less energy than today’s top-of-the-line units. The refrigeration cycle is replaced with an absorption cycle that is thermally activated. It can be activated by natural gas or solar energy and uses very little electricity. [www.nrel.gov/features/20100611_ac.html](http://www.nrel.gov/features/20100611_ac.html)

- **Thermoelastic cooling**

  Researchers at the University of Maryland are developing a new “thermally elastic” metal alloy for use in advanced refrigeration and air-conditioning equipment. The self-expanding, high-strength alloy alternately absorbs or creates heat in much the same way as a compressor-based system but uses far less energy. According to researchers, it could make it possible to increase energy efficiency of cooling equipment by 175% compared with current vapour-compression systems. The University of Maryland—which received a 300 000 USD grant from US Department of Energy—will develop a 35 kW prototype with the goal of establishing the commercial viability of thermoelastic cooling. [www.mse.umd.edu/news/news_story.php?id=5007](http://www.mse.umd.edu/news/news_story.php?id=5007)

- **Cool buses**

  BerlinerVerkehrsbetriebe (BVG) has installed CO2 air-conditioning systems in seven of its city buses operating on different routes in Berlin and covering 200 to 400 km per day. Germany’s Federal Environment Agency has urged all public transport suppliers to adopt CO2 cooling as a standard. If results from real-life tests are satisfactory, BVG is open to install R744 air-conditioning systems in all city buses. BVG’s decision to replace R134a with CO2 in its cooling systems was lauded by the German Federal Environment Agency (UBA) President Fastbarth as “farsightedness”. Kothka has invested only 5% of all new city buses in Germany were equipped with an air-conditioning system, this figure rose to 64% in 2008. 100% of all long-distance coaches today are equipped with air conditioning. With an average leakage rate of 13.3% for new coaches and 13.7% for new city buses, all German buses together emitted 100 tonnes of R134a in 2008 (140 000 tonnes of CO2 equivalents). [www.r744.com](http://www.r744.com)

- **First hospital catering facility refrigeration system to run with CO2 in the UK**

  A CO2 unit supplied by Green & Cool has been installed and commissioned by CCS Refrigeration on behalf of Medirest to provide for the on-site catering of patients, restaurant and hospital staff at the Homerton University Hospital in London, UK. The water supply for the large CO2 chiller cold room is run from the existing ammonia chillers supplied by J & E Hall and installed some 75 m away. Thus, the complete system runs on natural refrigerants, with the ammonia system chilling water to create 8000kW of cooling. By 2010, 90% of all new UK hospitals will be operating with CO2 refrigeration systems. The technology is applicable for refrigerating warehouse companies around the globe. The company says its innovative shelf life indicator is able to precisely measure the freshness of food items as they pass through the supply chain from factory to consumer and could lead to considerable cuts in the amount of waste generated. It contains a range of non-toxic chemicals which react and change colour according to time and temperature. The technology is applicable for all products where quality and lifespan depend on time and temperature variables during storage, as well as items where quality depends on maturity and ageing. The technology is based on the actual storage conditions each individual product is exposed to rather than a general estimate made at the processing plant. A prototype of the device is being tested by the grocery chain NorgesGruppen, baked goods supplier Lammannen Unibake, and McDonald’s Norway. [Sources: Food Quality News, The Research Council of Norway](http://www.foodqualitynews.com/the-research-council-of-norway)

For a greater insight into indicators and monitoring throughout the cold chain, download
free of charge the IIR’s Informatory Notes on Temperature Indicators and Time-Temperature Integrators and on RFID Technologies for Cold Chain Applications.


Air-conditioned trains in the London tube

The London Tube has air-conditioned trains at last. The first of 191 brand new walk-through-air-conditioned trains came into service in August 2010, on the Metropolitan line. Roll-out should be complete on this line by 2011, by which time trains will also start being delivered on the Circle, Hammersmith and City Lines. The trains which are built by Bombardier Transportation will cost a total 1.7 billion €. There is to be one air-conditioning unit per car on the 7 or 8 trains. Each unit has a cooling capacity of 31 kW per unit. Energy consumption in cooling mode is up to 16 kW in extreme conditions, but is more typically 13 kW. www.tfl.gov.uk

Cryotemperatures save flooded archives

In February 2010, “Xynthia”, a major storm swept over La Rochelle, France. In order to rescue the archives of the “Conseil Général de Charente Maritime” the departmental council during current history,” they add. www.physorg.com/news301330163.html

Voice-prompt technology for the first time in China: Hisense Hitachi has launched a multi-function remote controller for air conditioners with a voice-prompt feature when the user adjusts the temperature. JARN, July 25, 2010

The bank so far contains frozen sperm and embryonic cells from mushroom coral and rice coral, but researchers intend to expand the cell library to include other Hawaiian coral species. The project is jointly conducted by the Smithsonian Institution and the Hawaii Institute of Marine Biology at the University of Hawaii at Manoa, on Coconut Island in Oahu. The frozen banked cells are viable, and the frozen material F can thus be thawed in the future or even 1000 years from now to restore a species or population. Some of the frozen sperm samples have already been thawed and used to fertilize coral eggs to produce developing coral larvae. According to the researchers, Hawaii’s reefs are threatened by pollution and destructive practices including dynamite fishing.” Unless action is taken now, coral reefs and many of the animals that depend on them may cease to exist within the next 40 years, causing the first global extinction of a worldwide ecosystem, they add.

Regulations—Standardization

F-gas

The EU Commission has launched the “F-Gas Regulation” review, as mandated by Article 10 of the Regulation: “By 4 July 2011, the Commission shall publish a report based on the experience of the application of this Regulation”. In this respect, a service contract has been awarded, whose main objectives are: reviewing international and national markets and policies on F-gases; assessing the effectiveness of the present regulation; developing implementing options for an international emission reduction arrangement for HFCs and other F-gases and identifying technically feasible, effective, efficient and consistent options for further EU action; analysing the economic, social and environmental impacts of identified options.

The objectives defined in the specifications of the invitation to tender mention that “the Commission intends to conduct a first review on the effectiveness of the current Regulation, including an assessment of the feasibility to implement emerging solutions at the international level for a phased down of fluorinated gases, particularly HFCs.”

Consultations with stakeholders from the relevant sectors are foreseen. The IIR will participate in the Expert Group set up by the EU Commission in order to comment on studies carried out by the Commission and to provide expert advice during the preparation for the review. Mr Carmine Casale, member of the IIR’s Commission B2, is the representative of the IIR in this Expert Group which held its first meeting on October 11, 2010.


IIR co-sponsored conferences

Tokyo - Japan - November 11-13
Cryomedicine 2010: the New State of the Art
Masashi Watanabe: lowtemp37@med.toho-u.ac.jp
Fax: + 3 4122 6321
http://homepage2.net.yamanashi.jp/cryomedicine/
Commission: C1

Singapore - Singapore - November 29-December 1
Prof. Bidyut Baran Saha: saha@mech.kyushu-u.ac.jp
http://impres2010.org
Commissions: B2, E2

Belgrade - Serbia - December 1-3
41st International Conference on Heating, Air Conditioning and Refrigeration
KGH: office@kg-kongres.org
Prof. Branko Todorovic: todorob@sk.net.rs
Fax: +381 11 2231 372
http://www.kgh-kongres.org
Commissions: B1, B2, D1, E1, E2

Constantine - Algeria - December 6-7
1st International Seminar on Air-conditioning and Energy Engineering (SICCLE‘2010)
Said Zid: sigcle2010@yahoo.fr
http://www.sigcle2010.com
Commissions: B1, B2, E1

Amsterdam - Netherlands - March 21-24
Gastech 2011 Conference & Exhibition
Lynne Robocop; lynne@dmgworldmedia.com
Fax: +44 (0) 203 180 6550
http://www.gastech.co.uk
Commission: A2

Houston - United States - April 16-19
LNG 17 - 17th International Conference & Exhibition on liquefied Natural Gas
Kirsty Prentice: kprentice@lng17.org
Glenys Ford: gford@lng17.org
http://www.lng17.org/
Commission: A2

IIR Agenda