HKUST’s Environment Week 2008 (June 2-6) Promises to be A Future-Shaping Event

Every year or two, the Health, Safety and Environment Office (HSEO) organizes an environmental, health and safety promotion week to help increase awareness of our campus community towards various EHS issues. Typically, these events are filled with general interest lectures, exhibitions and demonstrations. While the format of the Environment Week 2008 will still be similar, the scope and theme are quite different.

In past years, the majority of our effort focused on promoting the fundamentals of environmentally friendly practices within HKUST. Many of them involved operational issues like energy conservation, waste reduction, and resource recycling. Along these lines, there have been major accomplishments, awards and recognitions associated with many of our programs such as the chemical exchange program, indoor air quality management program, waste reduction program, etc. At the same time, there have been energy savings which amount to millions of dollars together with reduction of thousands of tons of CO$_2$ emissions per year.

The above-mentioned achievements were mostly led by the Facilities Management Office and HSEO colleagues with participation of some interested members of our campus community. Yet, the greatest challenges lie in who else will undertake these efforts and what else should be done. While waste reduction campaigns and programs for recycling of a variety of items have already been launched, our campus community as a whole has yet to participate fully in creating a sustainable campus environment. Simple observations tell us that we still have a way to go to get people to walk up or down one flight of stairs, to switch off lights when leaving empty offices, to turn off computers when leaving work, etc. What about fully integrating sustainable practices in teaching, research and administrative activities? Additional culture-building efforts will be needed to achieve full ownership and participation by our staff and students.
As a tertiary educational institution, our mission should include educating our students about current societal
values and virtues in addition to imparting knowledge in various academic disciplines. Our goal should be to prepare students to help make a difference by actively contributing to shaping our current and future society. In this connection, sustainable practices must be a significant and integral part of all aspects of campus life, including academic endeavors and personal life styles.

It is with these thoughts in mind that the Environment Week 2008 has been organized. To foster more involvement of our entire campus community, particularly our students and academic personnel, sustainability officers from internationally leading institutions will come and share with us their visions and experiences. In addition, renowned environmental scholars in science, engineering, business and social science will also come to present lectures on the environmental challenges and opportunities in different disciplines. There will also be panel discussions by prominent members of the greater environmental community in HK and by environmental officers from the local tertiary educational sector.

We envisage that HKUST will become a sustainable university where sustainability is practiced in all aspects of its teaching, research and operational activities and that all students and scholars coming through HKUST will acquire this sustainability culture and will help spread it into the greater HK community and be able to make a sustainable impact in the local, national and international arenas.

For details of the Environment Week 2008 which is scheduled for June 2-6, please access: http://ienv.ust.hk/envtweek/
Canada Declares Banning of the Use of Bisphenol A in Baby Bottles

Recently Health Canada has announced the ban of the use of bisphenol A (BPA) in baby bottles after a preliminary report issued by the National Institute of Health discovers a cause of concern for neural and behavioural effects in fetuses, infants, and children due to current human exposures to BPA. One of the major polycarbonate (PC) bottle producers Nalgene has also made announcement of removing all polycarbonate plastic water bottles made of BPA from store shelves shortly after the release of the report. The measure seems to be a precautionary one but the impact will certainly go deep into the consumers who have chosen to use PC bottles, thinking the containers are the safest, reusable plastic bottles available in the market.

Bisphenol A (BPA; 2,2’-bis(4-hydroxyphenyl) propane) is a common component in epoxy resins and polycarbonate plastics. It exists at room temperature as a white solid and has a mild typical “phenolic” or hospital odour. Polycarbonate plastics are typically clear and hard materials which make them ideal for making food containers, impact-resistant safety equipment, compact discs, etc. BPA containing epoxy resins can be found in the coating of food cans, food packaging materials and water supply pipes. The main source of BPA exposure for most people is through diet. BPA in food and beverages accounts for the majority of daily human exposure.

BPA is an estrogen-like chemical suspected of causing adverse reproductive and developmental effects on human. Majority of the BPA ingested into the body will be converted to a biological inactive, water soluble, metabolite bisphenol A-glucuronide. The process is carried out by an enzyme in the liver which enables the body to eliminate the chemical through urine and minimizes BPA’s ability to interact with the body. Studies have shown that very young rodents metabolize BPA to its biologically inactive metabolite less efficient than adult and this results in a higher circulating concentration of free BPA in the blood. The issue has not been specifically studied in human, however, reduced ability or efficiency to metabolize BPA is generally predicated for human fetuses and infants. Although there is no direct evidence that people’s exposure to BPA will lead to adverse health effects, studies have shown that rodents’ exposures to high levels of BPA during pregnancy can reduce survival, birth weight, growth, and delay onset of puberty in males and females. In addition, a variety of neural-behavioral alterations have also been observed in rodents exposed to high levels of BPA. There were also studies which showed positive correlations between neural-behavioral alterations and BPA exposure in rats and mice at much lower dose levels. However, these findings are still not conclusive and may require further evaluation to establish a plausible causal relationship. It seems that there is still a long way forward before an affirmative conclusion can be drawn on the effects of human exposures to low levels of BPA.
The move taken by the Canadian Government has certainly left a pointer for the rest of the world to ponder upon. Whether other countries will follow suit has yet to be seen. Further discussion on the topic is expected to continue until the scientific community can put an end to the debate and hopefully, the sooner the better. As for the consumers, at the moment, to use PC bottles or not is still a matter of personal choice. Plastic bottles made of high-density polyethylene (HDPE) and polypropylene (PP) are possible options. However, these bottles may not look as fancy and trendy as the PC bottles which is why these bottles are not popular in the first place.
A Better Way to Disinfect

Many of us are aware of the fact that the chemicals we use to kill microorganisms or insects are most of the time also toxic to human beings. So the challenge is always there to find better alternatives, using less toxic chemicals or other means, so that we can eliminate the target organisms without adversely affecting human or other living organisms.

Source: http://www.bioquell.com/Products.asp?id=234

We face a similar challenge in disinfection, which is a critical component in biomedical research and health care, and in industries such as pharmaceutical, and food and beverage manufacturing. The prime targets include controlling infectious microorganisms, preventing contamination of microbial work or product by environmental microbes, and cross-contamination between microbial cultures. Traditionally we rely on different methods, such as pressurized steam sterilization (i.e. autoclave), radiation (e.g. ultraviolet light and gamma rays), and various liquid chemical disinfectants (e.g. alcohol, phenol, hypochlorite, etc.).
A very effective form of disinfection is the use of gaseous chemicals in a fumigation process. A gas disinfectant can spread readily within the space to be disinfected. It can reach hidden corners and blocked surfaces. However, a gas disinfectant is also difficult to contain, therefore a well-enclosed space is a prerequisite to fumigation. Common examples are fumigation of a wooden building enclosed in a huge tent for termite control, disinfection of medical instruments and supplies by ethylene oxide in an air-tight chamber, and fumigation of a biological safety cabinet (BSC) by formaldehyde when there is a need to change the High Efficiency Particulate Air (HEPA) filter or to perform other services inside the BSC.

This last gaseous disinfectant, formaldehyde, is important for us in HKUST, because this is the chemical we have been using to disinfect not only our BSCs, which number around 60, but also animal isolators and individual rooms in our Animal and Plant Care Facility (APCF), and in-line HEPA filters serving facilities involved in infectious work. Not surprisingly, being an effective gas disinfectant, formaldehyde is toxic to human. Formaldehyde is also widely used in biological tissue preservation in the form of an aqueous solution (formalin), and is a common ingredient in many synthetic polymers, however, its harmful effects have gradually become known. It is a strong irritant to the eyes and respiratory system, and is a systemic poison. But more importantly, in 2004, the International Agency on Research for Cancer (IARC) under World Health Organization determined that formaldehyde is “carcinogenic to human”, capable of causing nasal pharyngeal cancer. (http://www.iarc.fr/ENG/Press_Releases/archives/pr153a.html)

Even though some countries still only consider formaldehyde to be a potential human carcinogen, European countries decided in 2007 to completely ban formaldehyde production and sales. It is therefore prudent for us to look for alternatives to this toxic and carcinogenic chemical, although legally we can still use the compound in Hong Kong.

A technology using vaporized hydrogen peroxide for gaseous disinfection was developed some years ago to meet the need of the pharmaceutical industry. Studies have been conducted and revealed high efficacy of hydrogen peroxide in killing various forms of microorganisms, including pathogens such as Mycobacterium tuberculosis. One important advantage of hydrogen peroxide is that it decomposes into oxygen and water, both harmless to human, and leaves no harmful residue in the disinfected space. The gas phase hydrogen peroxide technology has since been adapted for health care and laboratory applications.

Health, Safety and Environment Office is now in the process of acquiring a gas phase hydrogen peroxide generator for our disinfection needs. This unit will replace our existing formaldehyde fumigation set-up. The price of the hydrogen peroxide unit is quite a bit higher, but the additional cost is a worthy price to pay so that we can eliminate our reliance on the toxic and carcinogenic formaldehyde. There will be some necessary changes in disinfection protocol, and the unit will also be coupled to a new animal cage washer to be purchased by the APCF, so that we can maximize the use of the new equipment.
How VHP Biodecontamination Works

Vaprx®
Hydrogen
Peroxide
Sterilant

2H₂O₂

Vaporization
4-80°C
Non-toxic by-products

Sporicidal at low concentrations
Typically 0.1-2 mg/l at 25°C

VHP® 1000-ARD Biodecontamination System with Sensing Unit

Source: [http://www.steris.com/resources/includes/documents.cfm?name=103016144524_3.pdf](http://www.steris.com/resources/includes/documents.cfm?name=103016144524_3.pdf)
HKUST Staff and Students Work Together to Preserve Our Coastal Marine Ecosystem

Each year, staff and student divers participate in the HKUST coastal clean-up to remove jetsam, flotsam and other debris from our coast and sea floor in an effort to preserve our pristine coastal environment, and to enable marine organisms to flourish without man-made hazards. This tradition has garnered more and more support each year. Last year, our President, Professor Paul Chu, also took part in the event and in the process helped raise funds for our HKUST Coastal and Marine Laboratory.

Waste items recovered usually include various plastic ware, metal containers, glass bottles, construction waste, etc. Of particular concern is the presence of abandoned fishing nets which tend to aggregate at the sea floor, trap marine animals, and starve them to death. Thanks to our diving colleagues and students, the removal of these items helps to ensure our coastal marine ecosystem can be maintained in a healthy state.
Unless you are a diver, you probably don’t know how beautiful our coast is below the surface. Recently, the diver group held an underwater photo contest in an effort to document and publicize this ecological treasure, and to educate members of our campus community on the importance of sustaining our coastal marine environment. Shown below are three winning entries. Other photographs will be featured during the HKUST Environment Week 2008, which is coming up in the first week of June. We hope you will enjoy these exhibits and appreciate the importance of environmental conservation as a fundamental component of sustainability for our campus.

Winner: Ms Wing Yee CHOY
First Runners Up: Prof Ajay JONEJA
Second Runners Up: Mr Min Kam CHAN
**Eat Smart!**

The promotion of EatSmart Restaurant program at catering outlets in HKUST

A balanced diet is a key factor to prevent ill health! The Department of Health is launching a “EatSmart Restaurant” campaign in the local community. The aim of this campaign is to encourage the “EatSmart” restaurants, i.e. the restaurants participating in this campaign, to provide healthy and delicious dishes to the public.

The Health, Safety and Environment Office and the Campus Services Office join hands to launch this program in our campus community to promote a healthy diet. All caterers are encouraged to support the program and to provide healthy food choices for customers. The caterers will be required to attend a training session organised by the Department of Health. After the training, the caterers will design “EatSmart” dishes based on the principle of more fruit or vegetables, and less oil, salt and sugar. For details of the program, please visit the “EatSmart Website” [http://www.eatsmart.gov.hk](http://www.eatsmart.gov.hk).
EatSmart Restaurant

Yummy!
Since the implementation of the Fire Safety Ambassador Scheme at HKUST in 2002, a total of 144 staff members were trained and appointed by the Fire Services Department (FSD) as Fire Safety Ambassadors (FSA) and FSA Trainers at the end of 2007. Details of the distribution of FSA and FSA Trainers are listed out in Figures 1 and 2. The appointment is valid for life unless under unusual circumstances such as misconduct prejudicial to public interest and the reputation of the FSD or involvement in any commercial activities in the name of FSA, the appointment will be revoked.
Figure 1: Fire Safety Ambassadors at HKUST
At departmental level, staff members who were appointed as “Fire Safety Ambassadors” should help Head of Department (HOD) and Departmental Safety Officer (DSO) execute the following fire safety duties:

(a) disseminate fire safety messages to stakeholders;

(b) promote fire safety awareness among stakeholders and

(c) identify fire hazards and report them to the HOD or DSOs for remedial action.
The next FSA training is tentatively scheduled for July/August this year. All staff members are welcome to join. Please pay attention to the Health, Safety and Environment Office’s announcement in July.