

From the Desk of Chairman

Environment Audit **Part 4 - 77**

Orpower 4 Inc. a Kenyan company, has been operating a geothermal power Olkaria III, since 2000 and selling electricity to the Kenya Power and Lighting Company for industrial and other uses. Besides electricity, the power station also produces carbon dioxide which is sold to flower growing farmers and to soft drink manufacturers. The inputs comprise geothermal fluids, i.e., high temperature steam and brine, in addition to pentane which is deployed as a motive fluid and is recycled without any waste. The wastes generated include spent geothermal fluid, waste heat, electromagnetic radiation, waste water, garbage, and sewage.

In order to assess the environmental impact of the project, an audit was conducted to find out its effects on health and safety of workers, wildlife, neighbouring indigenous people, farmers and the Lake Naivasha. The 'Audit Report' in the present issue of the **WISTA: Environment Audit** is based on this environment impact assessment study carried out in September 2010, and presents its findings and recommendations.

The Indian government plans to set up an independent environment regulator, the National Environment Appraisal and Monitoring Authority (NEAMA), mandated with the taste of reforming the country's intricate planning rules and enhancing environmental protection, ensuring robust enforcement of environmental laws, and promoting green norms among businesses.

In Focus covers the framework responsibilities and the tasks that may be entrusted to the new authority, as also the gist of Prime Minister's observations while announcing the plan of constituting the NEAMA.

The 'Audit Guide' describes how to conduct a waste audit to quantify the amount and types of waste generated by an organization, its current waste practices and the way these can be improved, including better use of natural resources.

Other features covered include: New Technologies; New Products/Equipments; Air, Water, Solid/Hazardous Waste; Legal Scene; Crime & Damage; Awards; Forests & Wildlife; and other such regular features.

We welcome comments and suggestions

Dr K V Swaminathan

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This publication aims at disseminating information on pertinent developments in its specific field of coverage. The information published does not, therefore, imply endorsement of any product/process/producer or technology by WITT.

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AUDIT REPORT

OLKARIA III GEOTHERMAL POWER PLANT

Background

Since the year 2000 Orpower 4 Inc. has operated a geothermal power station on the south western slopes of Olkaria hill. The power station initially generated 12MW of electricity, which was boosted to 48 MW of electricity (48MWe) in 2004. The power is sold to the Kenya Power and Lighting Company Limited.

Technical Description

Raw Materials: The raw materials constitute the geothermal fluids (high temperature steam and brine) and the heat and pressure contained therein. Pentane is used as a motive fluid in a closed cycle, so that it is recycled, and there is little loss or waste of pentane.

Products: The products are electrical energy, which is sold to the Kenya Power and Lighting Company Limited, and carbon dioxide gas.

Wastes: These include the spent geothermal fluid, waste geothermal gas, waste, heat, electromagnetic radiation, waste water, garbage, and sewage.

Objective, Scope, and Criteria of the Audit

Objective: To review and assess the activities of the project, and its impacts on the environment and the community.

Scope: There have been five previous environmental audits which have reviewed impacts of the plant on the environment. The reviews included impacts of the project on the health and safety of the workers, wildlife, and the surrounding indigenous communities, as well as on the flower and wildlife ranch-farmers, and on Lake Naivasha.

Criteria: This report is prepared on the basis of field and literature surveys. The Environmental Audit Reports of 2004, 2005, 2006, 2007 and 2009 have been consulted.

Socio Economic, Environmental, and Health and Safety Issues

Environmental concerns are centered around impacts on the wildlife, the hydrology of Lake

Naivasha, the flowers farms, and on the local Maasai community in terms of socio-economics aspects and health.

Potential Impacts of Project analyzed are:

Impacts on Soil Erosion: Bare soils being highly susceptible to erosion, planting of trees is recommended to counter this potential threat.

Civil Engineering Works: Most areas that had been excavated during plant construction had been replanted with grass and other vegetation. This is a continuous activity, and is supported by a nursery within the plant site.

Waste Water: Waste and storm waters are collected and discharged in a way that guards against gully erosion roads.

Laying of Additional Pipes: Clearing of vegetation for the purpose of laying and maintaining pipes also contributes to soil erosion.

Noise Impacts: Noise is generated during operation of the power plant. Noise levels are highest close to the turbines, up to 105 dB; generators, up to 100 dB; feed pumps, 93 dB; condensers, up to 86 dB; and air compressor areas, up to 82 dB (A). In these areas the use of ear protection is mandatory. The new plant has been built lower noise levels compared to the old plant.

Fire Hazards: Dangers of fire hazards arise from electrical short circuiting, lightning, and from the storage and use of pentane motive fluid. Because of being flammable, a water wetting down system and fire extinguishers are deployed in the station. Cigarette smoking is not allowed inside the power station compound.

Seismic and Volcano Hazards: The Olkaria hill is a volcanic feature, with volcanic eruption in the general area having occurred within the last 300 years (Clarke, M.C.G. and Woodhall, Allen, and Darling, 1990). Simiyu and Keller (2000) show that there is very little risk of a potentially destructive (magnitude $M_c > 5$) earthquake occurring within the geothermal field in a period of less than one century.

Geothermal Brine: The geothermal brines from the Olkaria III field have total dissolved solids concentrations in the range 2000 to

4000 ppm, consisting mostly of Na, CO₃, SiO₂, Cl, SO₄ and K. Boron and fluoride concentrations in the brine are well above acceptable levels, and therefore, leakage of the brine must be avoided.

Air Quality

H₂S Emissions: During the audit, spot H₂S concentrations in open plant area were found to range from 0.013ppm to 0.38ppm. The high values were at the steam vent sites. Predictably H₂S concentrations were highest in areas that were downwind of the plant.

CH₄ Emissions: Approximately 0.00043 tonnes/hour, or 3.8 tonnes/year are piped to Oserian Development Company as part of the NCGs. As there is no likely use of CH₄ in flower growth, it is assumed that the gas is released to the atmosphere.

Radon Emissions: Although it is not a project emission, it should be monitored since it is a source of exposure to radioactivity for the workers.

The Biological Environment: Environmental audit on biological environment was carried out in September 2010 on operational activities of the Orpower 4 Olkaria III. The Olkaria III area is partly located within the Hell's Gate National Park. The Park has an area of 68 km² and is situated 1,560 – 2,187 metres above sea level. The Park has some sensitive habitats, significant natural sites, and some unique and rare species of plants, wildlife and a variety of birds. Lake Naivasha, a Ramsar Conservation site is located 5 km from the geothermal site. This calls for special attention to preserve and protect the sensitive environment. The Narasha seasonal wetland, used as pasture by the Maasai, is located within 1 km of the project site.

Safety Measures: It is recommended that stricter measures be instituted with respect to safety procedures. The incident and accident report board should be properly re-set each time an incident takes place. At the time of the audit, the board did not reflect the above four incidents.

Recommendations

1. Orpower 4 Inc. should continue to regularly monitor concentrations of H₂S, noise levels, and leakage of brine and steam.

2. Regular inspection for malfunctioning systems and structures, and their immediate repair should be continued.
3. Leaking pipes should be repaired immediately.
4. Disposal of steam trap fluid can still be further improved.
5. Regular fire and safety drills should be conducted to ensure preparedness of staff.
6. The Health and Safety Committee members should continuously receive training and be in a position to train other workers, according to the OSHA (2007) which requires "Provision of information, instruction, training and supervision necessary to ensure safety and health" by employers.
7. Regular removal and proper disposal of solid waste should be continued.
8. Monitoring of the status of flora and fauna, and re-vegetation of degraded sites should be continued in collaboration with KWS.
9. Interaction with the local community and assistance to community projects should continue, using established formal structures.
10. Sustainability of community projects should be built into all the initiated projects, as recommended in the Environmental Audit Report of 2009 Daily patrols and inspections of the plant area should continue.

Indicators of Acceptable Implementation

1. Low or zero H₂S concentrations in the plant area.
2. Low or zero hospital visits by workers due to work-related health issues.
3. Low or zero accidents and incidences (i.e. the number of manhours of accident free operation increased).
4. Flourishing vegetation around the plant
5. Increase in the number of mammals in the Park area. This indicator is, however, dependent on the cooperation among all players in and around the Park.
6. Improved and sustainable livelihoods for the Maasai community.

IN FOCUS

National Environment Appraisal and Monitoring Authority

India is a developing country and industrialization is a must to remove poverty. However, sustainable development and protection of environment as also looking after interests of poor people and farmers, are must.

According to Prime Minister Manmohan Singh, the regulatory framework for environmental clearance of development projects needs urgent streamlining and reform. Dr Singh added that the Centre would soon set up an independent regulatory body, the National Environment Appraisal and Monitoring Authority (NEAMA).

He further added that the new body would lead “a complete change in the process of granting environmental clearance”, while also helping to promote “green norms” among businesses.

The government has issued a draft proposal for the structure of the NEAMA and is currently inviting feedback from interested parties.

Singh signaled that the agency would ensure more robust enforcement of environmental laws. “Staffed by dedicated professionals, it will work on a full-time basis to evolve better and objective standards of scrutiny”, he said, adding that it would also work with the recently instituted National Green Tribunal to enhance environmental governance across India.

The PM said, “The very definition of growth has been enlarged to accommodate environmental related concerns. There is now general agreement that the environment cannot be protected by perpetuating the poverty of developing countries. Their basic concern is with development, and this is as it should be.

But it is also no longer acceptable to take as given that a certain degree of environmental degradation and over-exploitation of natural resources in the cause of promoting growth is inevitable. It is no longer possible to treat the environment with passive disregard. And it is no

longer tenable to pretend these are concerns only for the other or wealthier nations”.

In the backdrop of the controversy over environmental clearance to major projects, Prime Minister Manmohan Singh said that an independent regulator would soon revamp the process and help protect ecology without bringing back “the hated license permit raj.”

Praising the role of judiciary for protecting environment he maintained that in the 1990s, due to rapid industrialization brought about by economic liberalization, there was a threat of depletion of natural resources. But the judiciary had ensured there was no compromise on this issue.

However, he expressed the hope that in future there would not be much litigation in projects due to environmental issues.

Some of the steps being taken for sustainable development are “action for generating over 20,000 MW of solar energy by the year 2020”.

Through sustainable agriculture and water conservation, it is proposed to increase productivity of dry land agriculture and increase efficiency of water use.

All these steps will cumulatively lead to a carbon growth path.

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“But it is also no longer acceptable to take as given that a certain degree of environmental degradation and over-exploitation of natural resources in the cause of promoting growth is inevitable,” Singh said.

He maintained that it is no longer possible to treat the environment with “passive disregard.”

“And it is no longer tenable to pretend that these are concerns only for the other or wealthier nations” he said.

Though the draft proposed is not devoid of criticism from some environmental quarters. It is hoped it will bring in more sustainable Development in eradicating poverty.

NEW TECHNOLOGIES

Cars to Run on Recycled Newspaper

Scientists at the Tulane University have discovered a novel bacterial strain, dubbed "TU-103" that can use paper to produce butanol, a biofuel that can serve as a substitute for gasoline. Harshad Velankar, a scientist at David Mullin Laboratory says "Cellulose is found in all green plants, and is the most abundant organic material on earth, and converting it into butanol is the dream of many." In the United States alone, at least 323 million tons of cellulosic materials that could be used to produce butanol are thrown out each year.

Mullin's lab first identified TU-103 in animal droppings, cultivated it and developed a method for using it to produce butanol. A patent is pending on the process.

Mullin said "This discovery could reduce the cost to produce bio-butanol in addition to possible savings on the price per gallon, as a fuel, bio-butanol produced from cellulose would dramatically reduce carbon dioxide and emissions in comparison to gasoline, and have positive impact on landfill waste."

(Science Daily, Aug 26, 2011)

Filtration Technology

Sand has been used as cheap water filtration medium for hundreds of years. However, it produced an inferior quality of clean water.

Now, a team of scientists in Australia and the United States has come up with a way to coat ordinary coarse sand with a nanomaterial called graphite oxide, which can remove five times more impurities than ordinary sand. The graphite oxide is suspended in a liquid, to which the sand is added. This mixture is heated to ensure the sand is covered, then dried.

The researchers say that its activity was similar to that of activated carbon.

The method for treating the sand is simple and uses cheap materials, such as sulphuric acid, making

the technique likely to be used in developing countries, said Maina Majumdar, co-author of the study and a mechanical engineer at Monash University, Australia.

Scientists are testing this technology and also conducting field trials.

(SciDev.Net, Jul 8, 2011)

Power-Scavenging Batteries

A US law now compels new cars in United States to have tire pressure sensors, as optimized tire pressure saves fuel.

However, the present chips require frequent batteries change. Now MicroGen Systems, a startup based in Ithaca, New York, is developing energy-harvesting chips designed to power wireless sensors like those used to monitor tire pressure and environmental conditions. The chips convert the energy from environmental vibrations into electricity that's then used to charge a small battery. The chips could eliminate the need to replace batteries in these devices.

The core of MicroGen's chips is a one-centimetre-squared array of tiny silicon cantilevers that oscillate when the chip is jostled. At the base of the cantilevers is a bit of piezoelectric materials: when it's strained by vibrations, it produces an electrical potential that can be used to generate electrical current. The cantilever array is mounted on top of a postage stamp-sized, thin-film battery that stores the energy it generates. The current passes from the piezoelectric array through an electrical device that converts the current to a form compatible with the battery. When the chip is shaken by, say, the vibrations of a rotating tire, it can produce about 200 microwatts of power.

Robert Andosca, the founder and president of MicroGen Systems, expects the cost to be relatively low. The first market, Andosca hopes, to enter is batteries for tire-pressure sensors.

Andosca says that 64 million of these batteries are put into cars each year. He hopes that the energy-scavenging-and-storing chips would last the lifetime of the car.

(Technology Review, Aug 25, 2011)

NEW PRODUCTS/EQUIPMENTS

GPS Aquaplus™

Optical technology replaces the classic Galvanic method of dissolved oxygen measurement and offers many advantages.

The Galvanic method features a delicate oxygen permeable membrane. During measurement, oxygen must pass through the membrane and react with the electrolyte within the membrane cap. This creates a current proportional to the amount of oxygen present.

The Galvanic method, however, has the following drawback; a constant flow of liquid required to make readings because the oxygen is consumed as it passes through the membrane, the membrane itself is delicate and must be replaced every 1-2 months.

The new optical technology overcomes all these issues. The permeable membrane is replaced with a gas permeable sheet called a luminophore, which is a substance that can be excited by light. The luminophore is excited by blue light and dependant on the amount of oxygen present, varying levels of red light will be emitted. By measuring the delay of the returned red light with respect to the blue excitation, the level of dissolved oxygen present can be determined.

The optical electrode has many advantages over the Galvanic method. No flow of liquid is required and oxygen is not consumed across the membrane, the user replaceable electrode cap requires replacement every 1-2 years; a vast improvement on 1-2 months; and it requires no electrolyte solution.

AQUAREAD, a UK based company, has incorporated optical technology in its new portable optical dissolved oxygen system.

The AQUAPLUS measures optical DO% saturation, Optical DO mg/L, conductivity total dissolved solids, resistivity, salinity, seawater specific gravity, temperature, air pressure, height above MSL, time, date, latitude and longitude, and has a wide range of applications

from fish farming to brewing, along with surface, ground and waste water monitoring.

(Aquaread UK)

Hy-Optima 2700

Hy-Optima 2700, a new explosion proof in line Process Hydrogen Monitor, has been launched by H₂ Scan Corporation (USA).

According to the manufacturers this monitor incorporates most advanced functionality and the certification which means a safer environment for its users. The instrument uses a solid-state that is configured to operate in process control gas streams. The 2700 line of analyses includes models that can accurately measure hydrogen in process gas streams containing up to 20% by volume carbon monoxide (CO) and up to 10% by volume of hydrogen sulphide (H₂S).

The H₂ Scan Corporation claims this to be ideal for hydrogen production, refinery and petrochemical applications, where real-time measurements can enhance process plant efficiencies, diagnostics and maintenance management.

(Asian Environmental Technology Annual Buyers Guide 2011)

New Biomass Shredders

The West Salem Machinery (WSM) has introduced a new biomass shredder 'Super Shredders' which combine the efficiency of a high-speed mill with the durability of a heavy-duty grinder.

These machines are available with rotor widths from 60"-88" (1524 mm X 2235 mm), and deliver higher tip speed for smaller, consistent fiber sizing; increased screen area for more thru-put; and flexible/interchangeable tooling. The largest WSMS Biomass Super Shredder™ the massive Model 4888S, features a 48" dia. by 88" (1219 mm X 2235 mm) long rotor, and operates with 400-800 hp to convert high volumes of pre-processed biomass materials.

These machines have superior production rates upto 100 tph, eliminating the need for multiple machines.

(Solid Waste & Recycling, Aug 1, 2011)

AIR

Air Pollution in Delhi

To improve upon air quality which was crossing dangerous limits, Delhi switched over to CNG around ten years ago in public transport. However, the pollution level of Delhi's air has again risen to high level.

With 69 lakh vehicles plying on city roads, a growth of about 60 lakh in 20 years, experts say oxides of nitrogen (NOx) and particulate matter (PM) are now at critically high levels.

NOx and PM are known to cause cancer and asthma.

According to medical experts, signs of deteriorating health are already manifest. The Delhi cancer registry maintained by AIIMS shows a 2-3% rise in lung cancer cases every year. They say till some years ago, 14-15 lung cancer cases were reported for every 1 lakh cancer patients. Of late, they are getting about 13,000 new cancer cases each year of which 10% relate to lung cancer and about 30% of these have nothing to do with smoking.

(The Times of India, Sep 1, 2011)

Landfill Ban to Slash GHG

A new report by European Environment Agency states a Europe-wide landfill ban could cut 78 million tonnes of greenhouse gas emissions by 2020.

The study on waste opportunities, past and future climate benefits from better municipal waste management in Europe, states that there is a huge opportunity to cut the amount of greenhouse gases emitted from waste management practices, but European countries are not doing enough to embrace this.

In a business-as-usual scenario, net greenhouse gas emissions from municipal waste management would be cut by 44 million tonnes until 2020, compared to 2008. The main factors responsible for this improvement are reduced methane emissions from landfill and increased avoided emissions through recycling.

(Ede News, Aug 31, 2011)

Phasing Out ODS

Speaking at the beginning of a three-day training workshop for Customs, Police, Immigration, NIA, National Drug Enforcement Agency (NDEA) and other security enforcement agents on the Detection, Control and Management of ODS, the director of Technical Service Network (TSN) at the National Environment Agency (NEA), said that the Gambia government in its commitment to phase out the consumption and production of ozone depleting Substances (ODS) by 20110, has ratified both the Vienna Convention and the Montreal Protocol on substances that deplete the ozone layer.

Abdou Jeng, a senior customs officer, and also the trainer, called on his colleagues in the security to lead the fight against the smuggling and illegal entry of these depleting substances into the country. He said the training aims to strengthen the capacity of enforcement agents to enhance proper identification and detection of ODS at the entry points and or during circulation within our towns and villages.

(The Daily Observer, Aug 26, 2011)

Split Estate

Hydraulic fracture not only causes water pollution but also is a nuisance for air for those residing near wells.

Dee Hoffmeister, a resident of Dry Hollow in gas-rich Garfield County, details her family's long struggle with natural gas drilling fumes and various illnesses she and her children and grandchildren have endured. She urged the residents, after a screening of the award-winning documentary "Split Estate" to support Colorado Congresswoman Diana De Gette's Fracturing Responsibility and Awareness of Chemicals (FARC) Act.

The *Post Independent* last week also reported the state found evidence of potentially deadly levels of hydrogen sulfide gas at Noble Energy drilling rigs in Garfield County in 2009, though this is being denied by state officials.

A Global Community Monitor study found at least 22 toxic chemicals, including four known human carcinogens, in nine separate air samples taken near natural gas drilling operations by community advocacy and environmental group in Garfield and La Plata counties in Colorado and the San Juan Basin of New Mexico.

(Colorado Independent, Aug 29, 2011)

WATER

Punishment for Water Polluters

In its report to Parliament of India the Standing Committee on Water Resources has described the water pollution in the country as 'lurid'.

The panel, while blaming untreated industrial waste as one of the main causes of groundwater pollution, also said that growing construction of septic tanks in the countryside has become a possible source of soil contamination. It also expressed concern over industries making aquifer recharge structures ostensibly for groundwater recharge, ended up discharging their pollutants into it adding to the groundwater pollution.

The report says 'Given the fact that the present criminal prosecution system for environmental offenders has not been a success and that polluters of rivers/water bodies have been shielded behind the protection cover of the lengthy and time consuming legal process, the committee recommends the government to expedite the formation of National Environment Protection Authority which will hopefully impose penalty on offending industrialists, polluters'.

The panel said that there were 180,000 rural habitations suffering from water contamination and called upon the government to bring out a comprehensive national plan to contain the alarming trend of ground water contamination in the country.

It said that ground water was also being polluted by man-made contaminants, such as manganese, lead, chromium, cadmium, as a result of mining activities or seepage from untreated industrial waste. The growing construction of septic tanks for want of sewer lines in the countryside has become another possible source of sub-soil contamination.

Noting that over 80 percent of country's rural domestic water requirement, 45 percent of created irrigation potential and about 50 percent of its urban and industrial water needs, were being met from ground water. The report said that exploitation of ground water resources be so regulated as not to exceed the recharging capacities. It said that artificial recharge of ground

water and rain water harvesting were steps with a lot of potential to augment ground water resources.

(News One, Sep 5, 2011)

Reducing Water Scarcity

'Green Economy Report', released by the UN Environment Programme (UNEP), in its water chapter says that investing in sanitation and drinking water, strengthening local water supply systems, conserving ecosystems critical for water supply, and developing more effective policies, can help avert the social, and economic costs resulting from inadequate water supplies.

According to the report released during World Water Week celebration in Stockholm, Cambodia, Indonesia, the Philippines and Vietnam, for example, lose an estimated \$9 billion a year, 2 percent of their combined GDP, due to problems caused by poor sanitation.

The report recommends taking a holistic approach and a long-term perspective, basing decisions on impact assessments to ensure sustainable water management, designing and implementing effective water-related policies, and promoting technology development.

(UN Daily News Digest, Aug 25, 2011)

Storm Water Control

US EPA has announced its \$100,000 plan in the Milwaukee area for developing new storm water pollution control strategies for the Menomonee River Watershed that could be put to use nationwide.

EPA Administer of the region said, an evolving partnership of all 17 communities in the Menomonee River basin - from Germantown to Greenfield and Brookfield to Milwaukee - could more effectively reduce storm water pollution throughout the watershed if they stopped working alone inside their municipal boundaries.

Besides water quantity improvements, communities could save money by sharing costs of regional pollution control measures.

EPA's grant of \$100,000 to the Milwaukee Metropolitan Sewerage District is one of the only three awarded to watershed pilot projects nationally, MMSD Executive Director Kevin Shafer said. The other grants were awarded to projects in Minnesota and New Mexico.

(Journal Sentinel, Sep 1, 2011)

SOLID/HAZARDOUS WASTE

E- Waste Report

A report “A National Strategy for Electronics Stewardship”, was recently released by an Interagency Task Force – chaired by the White House Council on Environmental Quality, Environmental Protection Agency, and General Services Administration (GSA).

The report makes a number of important recommendations to promote green design of electronics, and to improve handling of e-waste coming from federal agencies.

However, environmentalists are not amused by it. They say the report has some good recommendations on green design and on using certified recyclers, but it completely fails to address what is generally recognized as the most serious e-waste problem, that is e-waste exporting to developing countries.

Barbara Kyle, national coordinator of the Electronic Take Back Coalition (ETBC), a national environmental coalition which promotes responsible recycling of e-waste said, “We are very disappointed that the Task Force missed the opportunity handed to them by President Barack Obama’s mandate to truly lead by example and ensure that all federal agencies do the right thing and not export obsolete used electronic equipment unless it is fully functional.

Eighty percent of children in Guiyu, China, a region where many “recycled” electronics wind up, have elevated levels of lead in their blood, due to the toxins in those electronics, much of which originates in the US. “We think it’s appropriate that the country’s largest electronics purchaser, specially one using taxpayer dollars, do everything possible to advocate for products that are less toxic, longer lasting, and more recyclable.”

(Solid Waste & Recycling, Aug 1, 2011)

Marble Slurry

To safeguard the environment and promote scientific disposal of mining waste, the Rajasthan State Pollution Control Board (RSPCB) will now allow new marble sawing units to start only on

precondition that mine owners will have to effectively reuse marble slurry within a year of getting license. This step has been taken as marble dust and slurry are hazardous for the environment.

For entrepreneurs to use it effectively, RSPCB has put together global research database on the use of marble waste for productive purposes. Research substantiates that marble is a rich source of calcium carbonate and can be reused in various ways.

There are around 4,000 marble mines and 1,100 marble processing units in Rajasthan. They generate five to six million tonnes of marble dust in the form of marble slurry during processing and slabbing of marble stones. A study indicates that indiscriminate disposal of marble dust on road sides is causing problems of drainage, flow regime, air pollution and damage to agricultural land. The porosity and permeability of the topsoil is reduced and it causes water logging, not allowing the water to percolate down.

As a spin off, marble mines have at the same time led to growth of many processing units engaged in cutting of marble in the form of gang saw and cutters. The new regulation is likely to see a more scientific and environment friendly approach to mining.

(The Times of India, Aug 30, 2011)

Plastic Waste for Road

With an aim to make the hill state plastic free, the Himachal Pradesh government claimed that it has developed the technique to make plastic road after utilizing 40 MT solid waste of plastic for tarring 86-km-long road in last two years.

While addressing the ‘Meet the Press’ program in Shimla, state capital, State Public Works Minister Gulab Singh Thakur said that State government has collected 105 MT plastic waste from the state and utilized 40 MT for the first time in the world in plastic tarring of 86-km-long road replacing bitumen. It had targeted to metal 150-km such roads this year. He said the 2 Circle of Public Works Department acquired shudder apparatuses meant for melting plastic garbage to 150 degree Celsius and mixing it with stone chips. This technique avoided the use of bitumen and proved to be more cost-effective and durable.

(newKerala.com, Aug 2, 2011)

AUDIT GUIDE

CONDUCTING WASTE AUDIT

Introduction

A waste audit is a formal, structured process used to quantify the amount and types of waste being generated by an organisation. Information from audits help identify current waste practices and how they can be improved. Managing waste can help organisation in:

- a more efficient and effective organisation,
- reduced waste management costs, and
- better use of limited natural resources.

Audits can be done on any type of waste, eg. paper and office waste, municipal waste, commercial and industrial waste, construction and demolition waste etc. There are a number of different ways to conduct a waste audit, such as visual waste audits, waste characterisation, desktop audits and others. The type of audit to be used depends on the type of waste, where it is and what is wanted to get out of the audit.

Conducting an Audit

Organizations are encouraged to contact the EPA for more information on waste auditing. Audits can be done either in-house (using agency staff), contracted out or a combination of both. Before launching into an audit a number of issues need to be considered.

Objectives of the Audit

The audit’s objectives will largely determine the waste types and physical locations to be audited. Some examples of audit objectives could be:

- to determine composition and quantities of waste being generated,
- to measure effectiveness of existing waste management systems,
- to identify opportunities for improving waste management systems and strategies, and
- to collect baseline data for measuring the effectiveness of waste minimisation strategies.

Management Approval and Support:

Management support is essential for ensuring the smooth completion of the audit, which means that any findings or recommendations are more likely to be considered and implemented. It will need to justify the time and resources needed to do the audit.

People to Help

Unless you have a tiny office you will need others to help sort the waste. Some estimates of how long it takes to do a waste audit are provided in Table 1.

A few tips for good audit are:

- *Consider all safety issues*
- Training, safety equipment and tetanus shots must be organised to ensure sorters are safe from potential hazards associated with handling waste. You will need to involve the agency’s occupational health and safety officer(s).
- *Keep policies in place to protect confidentiality*

The confidentiality and privacy of documents or personal information found in the waste stream must be assured. No documents can be read or removed from the sorting area. If waste is to be transported to another location to be sorted, then it must be stored and disposed of securely.

Table 1: Time and Resource Estimate for Different Organisations

Type of office/ building	Number of staff	Number of days waste is collected	Number of trained sorters	Time to do sorting
Small regional office, single story	<20	5	2	1 – 5 hours
Medium sized agency with three stories	<100	5	6-8	1 – 2 days
Large agency, multi-story building	450 – 500	5	2-5	3 – 5 days

- *Keep the date of the audit secret*

Staff must not know when the audit is happening, otherwise they may change their waste behaviors and audit results will not represent normal waste practices.

Steps to Conduct a Waste Audit

Auditing waste is a relatively simple process but can be fiddly. The four basic steps to doing an audit are summarised in Table 2.

1 . Plan the audit carefully and define the study area

Good planning is essential to ensuring the audit goes smoothly. You will need to get management support, define the objectives of the audit, organise people and deal with other issues raised as a result of the audit. This may take some time but the more effort you put in up front will pay dividends when the audit is under way.

2. Collect the waste from the study area

Cleaners or waste contractors can collect the waste for you. You will need to talk to building managers and cleaning supervisors to get their support. Cleaners must have clear instructions about the types of waste they are to collect and how

to label the bags to identify the source of the waste (that is, where it came from, e.g. ‘Level 1 kitchen’, ‘Level 2 offices’ etc). A trial run before the start of the official collection period is a good idea. This way you can step cleaners through the collection process and iron out any problems.

3. Sort the waste into different categories and record the data

Sorting the waste is an interesting part. A basic layout for a sorting area is illustrated below. After the locations from which the bag of waste comes is recorded, the bag is weighed and emptied onto the table and sorted into material categories (e.g. glass, office plastics, metal etc.). Each category is then individually weighed and recorded. The table is cleaned and the sorted waste disposed of, and the process is repeated for the next bag and so on.

4. Analyse the data and write up the results

Once all the waste is sorted, there will be a large number of data sheets showing the quantity of waste by material categories that was generated within each area sampled. This data is then entered into a database and analysed. Once analysed the results can be written up and recommendations made.

Table 2. Waste Auditing Steps

PLAN	1. Define the study area	Set audit objectives Determine location
	2. Collect background information	Visit locations Number of locations Number of staff When to audit
	3. Prepare for the audit	Collect audit sheets Brief/train cleaners
COLLECT	1. Collect the waste	Collect all waste Label bags Record relevant information
SORT	1. Prepare the sorting area	Cover table Have water
	2. Sort the waste	Weigh each bag Carefully open bags Sort into different categories Count and weigh each category Record findings Dispose of waste Repeat for all bags
ANALYSE	1. Enter and analyse the data	Enter data sheets into database Do calculations
	2. Prepare an audit report	Prepare audit report Recommendations

(Solid Waste District.com)

LEGAL SCENE

Businesses Sue EPA More

A study released by the US Government Accountability Office finds that businesses and trade groups, not environmentalists, file the most lawsuits against the Environmental Protection Agency (EPA).

John Buse, legal director at the Center for Biological Diversity, commented, “Conservative politicians and industry lobbyists have been attacking environmental group for suing the government too much, but this study clearly shows that business interests actually file the most lawsuit against EPA.” The right wing’s deafening silence when it comes to polluters’ lawsuits betrays its true agenda. It’s not really against litigation; it’s just against litigation to protect our air, water and environment.

Buse said, “We sue the EPA when it doesn’t comply with laws to protect clean air, clean water and human health. And more often than not, federal judges have agreed with us that EAP wasn’t doing its job.”

(Center for Biological Diversity, Sep 1, 2011)

ConAgra Sued

Milberg LLP filed suit against the food giant ConAgra in June, saying that the company’s wesson oil contains genetically modified ingredients and therefore doesn’t qualify as “natural,” Grist reports.

Milberg is now inviting consumers to apply to make a “free genetically modified organisms claim evaluation” on its website. The page doesn’t mention ConAgra by name and actually cites products by several manufacturers.

The site says, “Indeed, many companies selling GMO products target health and environmentally-conscious consumers by labeling them as ‘natural’, even though they are composed of GMOs”.

Kix and Frito-Lay is a wholly owned company of PepsiCo and while its products claim 100% natural, in actuality they contain GMOs.

Grist says the lawsuit could have a far-ranging impact, since up to 70 percent of processed foods sold in retail outlets contain genetically modified ingredients.

The law firm notes that the EU is seeking to give European nations the ability to limit or ban GMOs.

(Environmental Leader, Aug 26, 2011)

Plastic Ban Upheld

The State Supreme Court of California in a ruling said that the city of Manhattan Beach does not have to prepare a special report before implementing a ban on plastic bags. The court, in its 26-page opinion, reversed the judgment of a state court of appeals and upheld the citywide ban.

The City Manager of Manhattan Beach issued a staff report recommending the adoption of an ordinance banning the use of “point-of-sale plastic carry-out-bags” in the city on June 3, 2008.

This was challenged by ‘Save the Plastic Coalition’ and it claimed that the movement to ban plastic bags based on misinformation would increase the use of paper bags, with negative environmental consequences. The coalition notified the city that it would sue if the ordinance was passed without a full CEQA review.

The city then conducted an initial study evaluating the environmental impacts of the proposed ordinance.

The study noted the ban is likely to have some modest impact on improving water quality and removing a potential biohazard from the marine environment.

After various discussions, the city adopted the ordinance on July 15, 2008.

A month later, the coalition petitioned for a writ of mandate to bar enforcement of the ordinance until the city prepared an environmental impact report. The Los Angeles County Superior Court granted the writ.

However, the Californian Supreme Court disagreed on this and granted permission to city to ban plastic bags.

(Legal Newslines, Jul 14, 2011)

CRIME & DAMAGE

Elephant Tusks Seized

Poaching of elephant tusks has increased in Sub-Saharan African countries. Criminals kill Rhino & Elephant for their tusks. These tusks are being used for ornaments and some medicines.

Tanzanian authorities have seized more than 1,000 elephant tusks hidden in sacks of dried fish at Zanzibar port which were destined for Malaysia. The tusks nabbed in Zanzibar likely originated from mainland Tanzania.

Zanzibar police spokesman said two suspects have been arrested and are being questioned, "We don't know yet how much the elephant tusks weigh but Interpol officials from Dar es Salaam have arrived to investigate the incident."

According to police, most of the elephant tusks smuggled from the East African nation end up in Asian countries.

(World Environment News, Aug 25, 2011)

Paper Mill Spill Kills Fish

A paper mill in Bogalusa, Louisiana released a high concentration of waste material into Louisiana Pearl River on August 9, causing a massive fish kill, including federally protected Gulf sturgeon as well as catfish and flounder.

More than 400 people worked from boats and the river banks over the weekend to clean up the river in 90-degree heat. By 22nd August, the water was nearly clear of carcasses, but a ban on fishing and swimming remained in place pending water testing.

The State Department Environmental Quality said in a statement that Temple-Inland could face fines for violations, including failure to notify officials of the spill in a timely manner. It also asked the company to submit a plan for changes to prevent a resource.

Slidell lawyer Tom Thornhill has filed a class action lawsuit in state court against Temple-Inland on behalf of owners of land and businesses affected by the discharge.

(Reuters, Aug 23, 2011)

AWARDS

Most Sustainable Restaurants

Hugh Fearnmley-Whittingstall's River Cottage restaurants have been rated the most sustainable in the UK. This River Cottage chain was awarded the accolade by the Sustainable Restaurant Association (SRA), with waste management scoring top marks on its star rating system. The chain now recycles all its waste, including food and waste oil, which is turned into biofuel and then used by the local community college. Food preparation waste is turned into compost that is then used to grow vegetables.

The SRA's star rating system will be included in a number of restaurant guides from later this year in a bid to encourage more catering businesses to become more sustainable.

SRA's account manager, George Clark, said the rating reflected River Cottage's commitment to sustainability across the board.

(Edie News, Aug 23, 2011)

Stockholm Awards Nestle

The Stockholm Industry Water Award was established in 2000 by the Stockholm Water Foundation in collaboration with the Royal Swedish Academy of Engineering Science, and the World Business Council for Sustainable Development. It recognizes the business sector's contribution to sustainable water management, by minimizing water consumption and environmental impact. It is given to any sector of business and industry.

This year the Award was given to Nestle. Nestle received the Stockholm Industry Water Award for its leadership and performance to improve water management in its internal operations and throughout its supply chain on Aug 24, 2011.

The honorary award was presented to the chairman of Nestle SA, Peter Brabeck-Letmathe, at a ceremony at the World Water Week in Stockholm.

(Stockholm International Water Institute, Aug 24, 2011)

FORESTS & WILDLIFE

Forest Law Changes

Brazil is known to have reduced deforestation for past ten years by its policies to protect forests.

However, now proposed changes to Brazil's forest laws to cut back protection and offer wide ranging amnesties for illegal deforestation threaten to undo the country's performance in cutting back emissions and protecting biodiversity.

Environmentalists are not happy over this change and are criticizing it. The leader of WWF's Living Amazon Initiative, Claudio Maretti, told a recent seminar organized by NGO groups in Brasilia, over the last 10 years Brazil has set a highly positive example of conservation, not only by reducing the rate of deforestation in the Amazon but also by creating terrestrial protected areas.

Maretti said "The moment the forest law reform bill is approved, Brazil will lose that role". The country will lose its power of influence over other countries and that will generate considerable impacts, especially on Brazil's neighbours for whom Brazil has been setting a good example.

(Environmental News Network, Aug 31, 2011)

Protecting Marine Species

A study by researchers at Stanford University and the National Autonomous University of Mexico states that preserving just 4 percent of the ocean could protect crucial habitat for the vast majority of marine mammal species from sea otters to blue whales.

The study said that of the 129 species of marine mammals on Earth, including seals, dolphins and bears, approximately one-quarter are facing extinction.

Co-author Paul Ehrlich, professor of biology and senior fellow at the Woods Institute for the Environment at Stanford said, "It's important to protect marine mammals if you want to keep the ocean's ecosystems functional." Many of them are top predators and have impacts all the way through the ecosystem. And they're also beautiful and interesting.

The researchers identified the 20 conservation sites based on three main criteria: how many

species were present, how severe the risk of extinction was for each species and whether any of the species were unique to the area. The scientists also considered habitats of special importance to marine mammals, such as breeding grounds and migration routes.

(Science Daily, Aug 30, 2011)

Saving Sage-Grouse

The greater sage-grouse is known for its elaborate courtship dance on the Prairies. However, it is in danger of being wiped out in Alberta.

This year only 13 males were spotted strutting their stuff in southeastern Alberta, marking a nearly 98 percent decline from 613 in 1968, when the provincial government started keeping track of the species. At a two-to-one female-to-male ratio, experts suggest there are at best 40 sage-grouse left in Alberta, while a small remnant population hangs on around Grasslands National Park in Saskatchewan.

In a desperate bid to save the ground-dwelling bird, an emergency summit of conservationists and biologists is set next week in Calgary.

The Alberta government had already took the unprecedented step last spring of importing sage-grouse from Montana. But critics say governments aren't doing enough to protect the birds, particularly from the booming energy industry, which operates around their habitat.

The species doesn't respect boundaries, and saving it is further complicated by jurisdictional wrangling between provinces, which are responsible for managing wildlife, and Ottawa which has regulatory teeth that it's loath to use. The federal cabinet could order the province to act, but that has never happened under the Species at Risk Act.

The US is in the midst of a US \$112-million recovery program to bolster the estimated 200,000 sage-grouse left across 11 states. It was launched last year in lieu of listing the species as endangered under tough US regulations, which the oil, gas and wind industries opposed.

Mark Boyce, a biologist at the University of Alberta said, unless habitat is cleaned up, sage-grouse could vanish Alberta's landscape by next year. "It may be too late already," he said. "But until they are all gone, we'll keep going."

(Global and Mail, Sep 1, 2011)

ENERGY SCENE

Boosting Renewable Energy

Europe's largest carmaker Volkswagen announced it will boost planned commitment to renewable energy, investing almost 1 billion euros (\$1.44 billion) in the production of environmentally friendly energy over two years.

The company was looking to buy an interest in at least two offshore windparks in the process, and may announce by the end of the year its partnership with windpark developer Windreich.

Volkswagen already has some exposure to wind energy. The municipal utility in the German port city of Emden, where it builds the Passat, operates a windpark estimated to supply 20 million kilowatt-hours of electricity per year.

(Reuters, Aug 29, 2011)

Riverside Solar Project

Insolation (solar radiation) in the Mojave Desert is among the best available in the United States, and some significant population centers are located in the area. The solar plants can generally be built in a few years because solar plants are built almost entirely with modular, readily available materials, although financing has been difficult and the projects receive government-backed financing.

Secretary of the Interior, Ken Salazar, has approved the Desert Sunlight Solar Farm, a 550-megawatt (MW) solar power project to be built in the California desert east of Palm Springs. He said the Desert Sunlight Solar Farm is the largest photovoltaic facility Interior has approved thus far and, when built, will help power our nation and economy, with 12 large-scale solar projects approved in the last 18 months.

In July, Salazar approved two utility-scale solar developments in California, a wind energy project in Oregon, and a transmission line in Southern California that together will create more than 1,300 construction jobs and provide a combined 550 megawatts of electricity.

(Environmental News Network, Aug 11, 2011)

HEALTH

Health Effect of Manganese

Jelayne Dray Health Commissioner of East Liverpool, in her report to District Health Board said that two researchers may conduct separate health studies in the East Liverpool area to look at manganese levels and its possible effects within the community.

Haynes, a manganese researcher said that she is interested in comparing a study group in and around East Liverpool with a group currently under study in Marietta. She plans to compare and contrast the data with a control group in Cambridge. According to the information provided from Dr Haynes, her study design focuses on the vulnerability population of children ages 7, 8 and 9.

The study of the San Francisco State University researcher, Dr. Rosemarie Bowler, will focus on adults.

Dray was hopeful that their studies findings indicate the community is not at risk. Both the state and federal EPA recommended the additional monitoring for manganese.

(The Review, Jul 28, 2011)

Mineral Oil in Food

A report from US official food control says, harmful mineral oil recycled cardboard can find their way into food, even if the cardboard does not touch the food directly.

In tests on experimental packs of noodles, researchers found that food quickly absorbed ten times the recommended limit for these oils, even though the oils were in the corrugated box used to transport multiple packs, rather than in the individual food packaging. This happened even when the food was contained in clean paperboard boxes made with fresh fibers and mineral oil-free inks, and wrapped in polyethylene film that was also free of mineral oils.

The study found some food reached a level of 6.1mg/kg just after six weeks of storing as against permissible limit of 0.6 mg/kg of food. The researcher said it needs to be addressed with corresponding care.

(Environment Leader, Jun 17, 2011)

SCAN AROUND THE GLOBE

Reducing Carbon Intensity



Two 90-m-high cooling towers collapse following a controlled explosion at the Huaneng Changxing Power Plant.

China has set a target to cut its energy intensity (the amount of energy consumed for each unit of GDP) by 16 percent and reduce its carbon intensity (the amount of carbon emitted for each unit of GDP) by 17 percent from 2011 to 2015.

Vice-minister of the National Development and Reform Commission (NDRC) Xie Zhenhua said at a conference that a comprehensive plan to allow China to meet its objective, laid out in the 12th Five-Year Plan (2011-2015), of reducing carbon intensity by 17 percent reduction will be released soon.

Xie invited international collaboration in research and technology transfers from developed countries and said that China has set targets to boost its non-fossil-fuel use to 15 percent of energy consumption by 2020, and many obsolete and inefficient coal-fired power plants have been closed.

However, coal remains the primary source of energy in China, the world's largest consumer of coal, with more than 70 percent of the country's energy consumption depending on it.

(China - *China Daily*, Jul 29, 2011)

Radiation-Free Rice

After radiation from the smashed Fukushima Daiichi nuclear power plant had leaked across northern and eastern Japan since March some good news has come from near Tokyo.

The officials said that samples of rice grown in a town near Tokyo showed no radioactive

materials. Some local authorities are testing their rice to see if it contains too much cesium.

The local officials said rice grown in the town of Tako in Chiba prefecture, 240 km (150 miles) southwest of Fukushima, was tested to determine if more stringent checks are needed after the town measured high radiation in the ground.

Rice future prices rose sharply this week amid radiation worries, but analysts say Japan is unlikely to step up imports.

(Japan - *World Environment News*, Aug 11, 2011)

Strategy for Energy Future

Hekia Parata, Acting Minister of Energy and Resources, New Zealand, released the New Zealand Energy Strategy and the New Zealand Energy Efficiency and Conservation Strategy.

Mr Parata said that New Zealand was blessed with an abundance of energy resources. Our government's goal is to make the most of all the assets we have – hydro, wind, geothermal, oil, gas and minerals. "We want to use those resources responsibly to secure our energy future and to lift our standard of living. That is why the government is taking a balanced approach to building a sustainable energy and resources future."

New Zealand has a target of 90 percent of electricity generation to be from renewable sources by 2025 and the March 2011 result indicated renewables were 79% of electricity generation.

(New Zealand - *Govt. Website*, Aug 30, 2011)

Fracking Controversy

Fracking or hydraulic fracturing method to extract natural gas is not being liked by many across the world.

Now South Africa is also taken by this controversy. The fracking is stirring an environmental and property rights debate in South Africa. The controversy stems from concerns over the safety of the technology.

A group of energy companies, including Royal Dutch Shell and South Africa's SASOL, have leased rights to a huge shale field containing

underground gas, promising economic development and energy security.

However, the environmentalists are not happy about it. They are telling the South Africa government to put a moratorium on all further fracking permits.

(South Africa - *Environmental News Network*, Aug 31, 2011)

Nuclear Shipments

The British government’s Nuclear Decommissioning Authority (NDA) plans to make about 50 rail shipments over the next five years from the Dounreay nuclear site in Caithness to the Sellafield reprocessing complex in Cumbria.

However, its plan to transport 44 tonnes of radioactive uranium and plutonium by train has run into opposition from councils worried about accidents and terrorist attacks.

A consultation on the plan is due to end on 31 August, and if agreed, shipments will begin next year.

“Nuclear-Free Local Authorities”, a local government group says the plan fails to ensure that radioactive waste is managed as close as possible to the site where it was produced. It would also lead to increased radioactive discharges into the environment from Sellafield during reprocessing, the council argues.

(UK- *guardian.co*, Aug 26, 2011)

Pipeline Sparks Civil Disobedience

A proposed pipeline from Canada to several refineries around the Gulf of Mexico has sparked civil disobedience in the USA.

The movement has led to almost 400 arrests, making it the biggest environment-related action in the USA in a generation. The proposed 2,753-kilometre, seven-billion-dollar pipeline, called Keystone XL, will carry 700,000 to 800,000 barrels of oil a day and supposedly bring an end to the US’s dependence on hostile oil providers like Venezuela.

On Aug 3, Hansen, along with 20 other leading US climate scientists, penned a letter to the president that read, “It’s imperative that

we move quickly to alternate forms of energy and leave the tar sands in the ground – as scientists we can say categorically that [the Keystone XL pipeline] is not only not in the national interest, it’s also not in the planet’s best interest.”

In addition, scientists say that transporting the oil southwards through the US heartland towards refineries in Oklahoma and Texas would wreak havoc on bird habitats, devastate the environment along the pipeline’s prospective route, threaten the supply of freshwater in the Ogallala aquifer as the pipe crosses the Great Plains, and severely jeopardize the safety and autonomy of tribal lands lying between Alberta and Texas.

Reverend Paul Mayer, co-founder of the Climate Crisis Coalition also protested outside the White House

(USA - *Inter Press Service*, Aug 29, 2011)

<p>VISIT OUR WEBSITE FOR ENVIRONMENT RELATED PROBLEMS AND ALSO WIN A PRIZE</p>
<p>WITT ENVIS WEBSITE is a national repository and dissemination centre on Environment Audit & Accounting. It parks compilations of Environment Audit Reports, Guides, news items, books, periodicals, as also lists of Environmental Experts, Institutions and other ENVIS Centres. It also contains two bimonthly updates published by WITT, ie, WISTA: Environment Audit and WISTA: Environment Accounting, and the monthly ENVIS Newsletter.</p> <p>The Website facilitates meeting the emerging information needs of industries and institutions for managing environmental, social, and business issues and securing eco-friendly sustainable development.</p>
<p>The WITT ENVIS Centre also provides information and guidance to industries concerning environmental / pollution problems.</p> <p>Contact us on Email: witt@envis.nic.in; info@wittsenvis.org</p> <p>We will appreciate receiving your feedback. It will help us make our services more user-friendly; and you may win a prize too.</p>
<p>So Visit http://www.wittsenvis.org</p>

EXPERTS CONVERGE

Guardian Cleantech Summit 2011

The third annual Guardian Cleantech Summit takes place on 22 November in London, bringing international experts together to discuss driving investment and growth in a global cleantech market.

It will be attended by policy makers, investors, cleantech companies and entrepreneurs to discuss the state of the market, both in the UK and globally. The conference will explore real-life tactics and strategies for developing, scaling and financing the sector. Discussions will also look at the policies and regulations impacting on cleantech development.

The key speakers include:

Rt Hon Gregory Barker MP, Minister of State for Energy and Climate Change;

Domic Energy, chief of staff, BP Alternative Energy

Philip Erquiaga, director general, private sector operations, Asian Development Bank

Benjamin Sykes, director of innovation, Carbon Trust.

This is a unique opportunity for leading thinkers and practitioners to come together in a thought provoking forum.

(Carbon Trust, Aug 18, 2011)

International Sites and Spills Expo

The International Sites and Spills Expo – Cleaning Up Your World, the first event of its kind to combine hazardous materials management and site remediation with the common threads of cleanup and sustainability, will be held in Mississauga, Ontario, at the International Centre on November 3 and 4, 2011. The expo will feature three tracks of conference speakers over the two-day event.

Prior to official reception, the event will also hold two workshops. One workshop will focus on HazMat response training while the other will focus on Phase I Site Condition Requirements on Nov 2, 2011.

Speakers include:

Federal Finance Minister Jim Flaherty (invited),

Dec Doran, offshore containment and recovery specialist.

(Solid Waste & Recycling, Aug 1, 2011)

KNOWLEDGE SPREADS

Green Economy and Green Jobs in China: Current Status and Potentials for 2020

The report by Worldwatch Institute and co-authored with a research team at the Institute for Urban and Environmental Studies led by Dr Pan Jiahuate, cites alarming facts about the status of China's environmental stability, including the placement of seven Chinese cities on a list of the top ten most polluted places on earth.

In order to address its dire environmental problems, China is establishing millions of green jobs in the forestry, energy, and transportation sectors. In particular, China is making efforts to use wind and solar power to greatly reduce China's dependence on coal and create jobs in the manufacturing of wind turbines, solar photovoltaic panels, and solar water heaters.

Worldwatch's report is the first to highlight China's move toward a green economy and the jobs created along the way. The innovations highlighted in the report have the potential to affect the world in a positive way. The report states "One of the greatest lessons to be learned from the early days of China's green transition is that building a sustainable future requires using approaches and processes that are sustainable in practice as well." With more China-focused projects in developments, China can achieve sustainable agriculture transition towards green economy.

(Nourishing the Planet, Aug 18, 2011)

Health Hazard of Indoor Air Pollution from Bio-Mass Fuel Used in India

Biomass fuel is cheap and easily available. In India 577 million tonnes of bio-mass fuel is used annually, some of which is a mixture of hazardous chemical indoor air pollution (IAP). Those who are exposed in such environment for a long time could develop chronic mental and physical health problems, like reduction of lung function, anaemia, compromised unity and also the heart disease.

Nature Environment & Wildlife Society (NEWS) has done a comprehensive study on indoor air pollution (IAP) caused by bio-mass fuel burning and its possible severe consequences. The study report is available in a booklet form

(Nature Environment & Wildlife Society)