

From the Desk of Chairman

Innovation :

Part 3 - 50

The European Commission had recently commissioned a study that aimed at identifying opportunities to encourage monitoring and evaluation of innovation, and build cultures of evaluation more widely across EU. The study included setting up of case studies of evaluation in specific countries and regions, interviews with experts in the area, and the establishment and analysis of a database of innovation evaluation programmes in seven EC member countries, ie Finland, Scotland, Sweden, Germany, Hungary, Spain and the Walloon Region.

The Special Feature in the present issue of **WISTA: INNOVATION** focuses on the German experience since it encompasses a much wider approach of evaluation of innovation concerns and covers both spatial and temporal patterns of evaluation.

The feature 'In Focus' covers R&D Scorecard for the year 2005, published by the UK government. It contains extensive data on top 1000 global R&D companies and top 750 companies from the UK. The Scorecard finds that R&D is concentrated in the largest countries, sectors and companies and that R&D companies have continued to improve in all the regions and most rapidly in North America.

The International Science Linkages (ISL) programme of Australia supports Australians scientists to collaborate with international partners on leading edge science and technology in order to contribute to Australia's economic, social and environmental growth. Under this programme, Australia's policy of reaching out has made considerable headway with regard to S&T Cooperation with various countries, particularly with China. The 'Perspective' briefly describes the ISL Programme of Australia and cites the stance of developing collaboration with China.

Other features covered are: Scan Around Us, Frontier S&T, S&T for Basic Needs; Technology Development, Experts Converge, Knowledge Spreads and Scan Around the Globe.

We welcome comments and suggestions from our readers.

Dr K V Swaminathan

CONTENTS

- **From the Desk of Chairman** [P 2]
- **Scan Around Us:** Criticality of Innovative Thinking; Developing India's Cities; Hydrogen Fuel Gets a Boost; Innovative Uses of Local Resources; Making Websites User-Friendly; New Horizons in S&T; New Varieties of Ginger; Promoting of Innovation Among Students. [P 3-4]
- **Frontier S&T:** **Aerospace/Space* - Brazil's Astronaut Back on Earth; Britain Gives Up Stake in Airbus. **Biotechnology* - Genetic Changes Affecting Proteins; Making Personalised Medicine a Reality. **Drugs/Pharmaceuticals* - Drugs on Demand; Drug Delivery Catheter. **Electronics/Communications* - Consumer Electronics Show 2006. [P 5 - 6]
- **S&T for Basic Needs:** **Buildings* - Construction Innovation; Flushless Urinals. **Clothing/Textiles* - Imaged Non-Woven Fabrics; Irrigation System for Cotton. **Energy* - Harnessing Solar Energy; Wind Energy in UK. **Food* - Flat Peaches; Tomato Extract for Lowering Blood Pressure. **Health* - New Health Projects in Developing Countries; Treating Drug Resistant TB. **Transportation* - Building Bridge in Record Time; Recycling Tyres into Roads. [P 7 - 9]
- **Special Feature:** Assessing EC Innovation Programmes. [P 10 - 11]
- **In Focus:** R&D Scorecard 2005. [P 12]
- **Perspective:** Australia Reaches Out. [P 14 - 16]
- **Technology Development:** **R&D Commercialisation* - Glass that Picks Up Vibration; Licensing Survey Report 2004; Making the Blind Visible; Shotgun Licensed for Production. **Intellectual Property* - Protecting IP in China; Rush for "eu." Domain Names; Standing Patent Rule Reversed. **Technology Funding* - EU Telecom Sector Attracts Innovation; Funding for Technology Projects; SuperPower Awarded Contract; USA to Cut R&D Spending. [P 15 - 16]
- **Experts Converge:** CANEUS 2006; Workshop on Mercury Risks to Health. [P 17]
- **Knowledge Spreads:** Age-Related Depression; Creating Competitive Advantage. [P 17]
- **Scan Around the Globe:** New Solar Energy Centre (Australia); Science & Technology in Botswana (Botswana); Devouring the Amazon (Brazil); Combating Disease in America (Canada); Micro-Robot (Germany); Glasses that Hear (Netherlands); Advancing Public Sector Innovation (Norway); Boeing Agrees to Pay Hefty Fine (USA). [P 18 - 19]

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SCAN AROUND US

Criticality of Innovative Thinking

While the need for a highly educated workforce is a necessary condition for high employment and high wages, it is not sufficient. A critical ingredient is the presence of creative and innovative individuals, who can think out of the box.

These and other conclusions have been arrived at by the US based National Centre on Education and the Economy which was in India recently to study the country's resource base, project its future path, and understand its broader implications.

Viewing India's highly educated workforce which has brightened the country's image in the global market place, the study finds that one of the earlier beliefs of the Centre that only advanced nations had the resources to educate their workforce, was no longer viable. If to the available educated workforce even in developing countries was added the yeast of innovative thinking, the result would be explosive economic growth, as is presently being witnessed in China.

(Economic Times, Apr 17, 2006)

Developing India's Cities

The Asian Development Bank (ADB) is granting US \$2 million as technical assistance grant to the Govt of India for the improvement of the country's cities as a part of the Jawaharlal Nehru National Urban Renewal Mission (JNNRUM) which is an ambitious \$11 billion project to develop infrastructure in 63 of the largest Indian cities over the next seven years.

More than 285 million persons, or over a quarter of India's total population now resides in its cities, making the country having the world's second largest urban population, which is likely to reach 575 million by 2030. This urban renewal project, therefore, comes not moment too soon.

(ADB, Apr 11, 2006)

Hydrogen Fuel Gets a Boost

The Government of India has unveiled an ambitious plan to put one million hydrogen fuelled cars on Indian

roads and generate 1000 MW power from hydrogen by 2020 through public-private initiatives.

The plan for hydrogen fuelled cars which is aptly named Green Initiative for Future Transport (GIFT), aims to develop and demonstrate a hydrogen powered engine and fuel cell-based vehicles ranging from small cars and taxis to buses and vans.

The effort to generate electricity from hydrogen is called the Green Initiative for Power (GIP) and envisages the development and demonstration of a hydrogen fuelled engine and turbine as well as fuel cell-based decentralized power generating systems.

The need to shift from a hydrocarbon energy economy to a hydrogen economy is recognised the world over, and this plan will put India in the forefront of the global hydrogen energy economy, thus providing sustainable energy security for the future.

(VATIS Update, Jan-Feb 2006)

Innovative Uses of Local Resources

Development Alternatives (DA) which has long been in the forefront of sustainable development, is actively encouraging the innovative use of easily available local resources to generate employment and incomes in rural areas.

One such initiative has been the setting up of a Micro Concrete Roofing Tile unit in Datia district of MP. This unit, which went into production in December 2005, uses easily available, sand, stone dust, cement and coarse aggregate as its raw material. It produced 2000 tiles in the first month itself, with the capacity to produce 6000 good quality tiles per month to meet local needs as well as cater to regional markets.

Another initiative is the setting up of a power plant which is capable of generating 50 kW of electricity each day. It runs on a renewable fuel, Ipomea or lantana, which is a local weed that grows abundantly in the area. This plant is meeting the electricity needs for all the other sustainable development activities in the area.

(Development Alternatives, Mar 2006)

Making Websites User-friendly

Usability research is a new science in the UK and the USA and is barely 10 years old. In line with the trend a company in Pune, named Pure Information Technology Group, is now concentrating on making all digital interfaces user-friendly

All e-retailers are the potential customers of the company, which cuts across all domains like matrimonial sites, employment portals, online share broking and gaming, net banking, etc.

Companies are becoming increasingly dependent on websites for their business and an interface that is not directly usable results in the rejection of the product or service. For example, 'Call Now' type of messages must be prominent and a job site must have a bright and attractive colour to attract attention.

Presently there are only about 300 people involved in usability research in India, but the market is already worth Rs 50 crores and is a growing one.

(Business India, Apr 23, 2006)

New Horizons in S&T

India's premier science and technology institutions, including the Department of Science and Technology (DST); Department of Biotechnology (DBT); Science and Engineering Research Council (SERC); TIFAC; Indo-US S&T Forum; Amrita University; IIT Kanpur; Jawaharlal Nehru Centre for Advanced Scientific Research and SETS have entered into a five-year agreement with the 10-campus University of California System to carry out cutting edge research in globally challenging and impactful areas.

This initiative takes the collaboration between the University of California system and leading Indian Universities and scientific organisations to a far deeper level in areas of science, technology, research and education.

Areas of collaboration include biomedical and digital healthcare technologies; design and delivery systems; study of emerging infectious diseases; wireless and mobile communication; intelligent transportation systems; cyber security; technologies for disaster warning etc.

(Chemical Weekly, Mar 28, 2006)

New Varieties of Ginger

Three improved varieties of ginger (adrak), named Varadha, Mahima, and Rajitha, have been developed by the Indian Institute of Spices, Kozhikode, Kerala, which can give better yields and are capable of being grown in different parts of India.

The crop can be harvested 200 days after planting, and although it is grown mainly as a rainfed crop in Kerala and North-east India, it can also be grown as an irrigated crop.

About 1500 kg of seed would be necessary for covering one hectare of land. It is imperative for the field to be ploughed well and suitable beds to be prepared before the actual planting takes place. In addition the land requires to be manured well.

Paddy, castor, redgram, ragi, and gingelly are planted as rotational crops and these varieties of ginger can also be grown as an intercrop in coconut, orange, and coffee plantations. These varieties of ginger are ideal for the nematode infested soils of Gujarat.

(The Hindu, Apr 13, 2006)

Promoting Innovation Among Students

The Department of Science and Technology (DST) has entered into a collaboration agreement with the Confederation of Indian Industry (CII) and Intel Corporation to promote inventive and innovative activity among students and youth.

With this collaboration, two programmes with the common objective of promoting science, namely the Intel Science Talent Discovery Fair, and CII-DST's "Steer the Big Idea" stand merged into one programme called 'Initiative for Research and Innovation in Science' (IRIS).

This merger, besides avoiding a lot of duplication, would help extend the reach of science and innovation to far flung areas, and also mould innovative ideas and strategies to suit the specific needs of the area.

The initiative is expected to cover 20 lakh students in over 25000 schools in the country and would also give young innovators an opportunity to interact with Indian industry.

(PTI Science Service, Mar 1-15, 2006)

FRONTIER S&T

AEROSPACE/SPACE**Brazil's Astronaut Back on Earth**

Brazil's first astronaut Marcos Pontes, a 43 year old air force pilot, returned safely to earth in the Kazakh steppe after a 10-day trip in space aboard the space craft Soyuz with a Russian-US crew that had spent 6 months on board the international space station. Along with Pontes, were an American, Bill McArthur and a Russian, Valery Tokarev, all of whom had left the space station three hours earlier.

The Soyuz capsule, charred black from re-entry into the earth's atmosphere, made a soft landing with the aid of parachutes and rockets in the early hours of 9th April as Russian military helicopters converged on the landing site in a pre-dawn recovery mission. The crew after being pulled out from the small capsule were allowed to rest, as they sat covered with blankets to keep off the early morning chill, and drank hot tea.

Pontes, who had taken a Brazilian football team jersey into space to bring luck in this summer's World Cup, waved a Brazilian flag and beamed at photographers as he recovered from the landing, and pronounced that he was delighted to have fulfilled his childhood dream of being the first Brazilian in space.

(Khaleej Times, Apr 9, 2006)

Britain Gives Up Stake in Airbus

Britain's biggest defence and aerospace group BAE Systems proposes to sell its 20% stake in the Airbus consortium which has manufactured the Airbus A 380, the largest passenger aircraft ever built, thereby signalling the end of direct British ownership of civil aircraft manufacture. With this sale, Britain will be severing a link going back to the Concorde, the Comet and several other civilian aircraft that once made that country a leader in aerospace.

The buyer will be most likely EADS, the Franco-German combine that owns the other 80% stake and the sale proceeds, which are estimated to amount to 3 billion pounds are proposed to strengthen BAE's defence industry interests in USA.

(Times Online, Apr 9, 2006)

BIOTECHNOLOGY**Genetic Changes Affecting Proteins**

Scientists in Oregon University, USA, have been able to reach back 450 million years in time to reconstruct the evolution of two hormone molecules and their "receptors", the protein molecules that allow the body's cells to respond to the hormones.

The researchers have been able to trace back the stepwise genetic changes that allowed a single ancestor molecule to produce two different modern receptors, one for the hormone aldosterone which regulates kidney and brain functions, and the other for the hormone cortisol which regulates the body's response to stress.

To reconstruct the changes, the team first examined the receptors of several ancient vertebrate species, including lampreys and hagfish. Then applying standard statistical methods, they showed that the two receptors found in most present day vertebrates originated from a gene duplication that occurred about 450 million years back. Eventually they inferred the gene sequence of the ancient receptor, synthesised it in the laboratory and characterised its functions.

According to officials of the National Science Foundation which partly supported the research, the findings bear out the utility of computational approaches to study the structure of ancient molecules, and provide a window as to how evolution works.

(US National Science Foundation, Apr 9, 2006)

Making Personalised Medicine a Reality

Physicists at the University of California, USA have demonstrated that it is feasible to sequence DNA as it passes through tiny pores in a fast, inexpensive technique which brings personalised, genome-based medicine one step closer to reality.

The technique involves measuring the electric perturbations generated by a single strand of DNA as it passes through a pore more than a thousand times narrower than the diameter of a human hair. Current DNA sequencing technology takes several months and costs millions of dollars, and this new technique which can accomplish the same task at little or no cost and in a matter of hours, promises to revolutionise genome-based medicine.

(Univ of Calif, San Diego News, Apr 8, 2006)

DRUGS/PHARMACEUTICALS

Drugs on Demand

Tiny, hollow, temperature sensitive capsules made out of lipids (water repellent molecules in the same family as oils and fats) have been developed by scientists at the University of Illinois, USA, to carry chemicals and drugs to different parts of the body in a controlled manner.

These minute capsules which vary in size from 10 to 100 micrometres (millionth of a metre) would carry infinitesimally small quantities of medicines, and upon reaching the affected part of the body, would be made to collapse upon being cooled, and thereby discharge their contents.

The capsules are in the early stages of development, and scientists have yet to develop a suitable mechanism to cool the tiny pills without endangering the surrounding body tissues, but the day does not seem distant when these little packets will be delivering drugs on demand.

(University of Illinois, Mar 27, 2006)

Novel Drug-Delivery Catheter

Christos Panotopoulos, a Greek neurosurgeon, has developed an innovative catheter which can deliver drugs locally and can evacuate pathological fluids from the body.

The catheter is made out of a particular type of polymer which allows for a unique level of control over the diffusion of drugs into the tissue. It also avoids the problem of blockage found in many other systems, and it optimises the irrigation and aspiration of the tissues as the treatment proceeds.

The initial targets for treatment through this catheter are certain types of brain haematomas and some types of recurrent malignant tumours of the brain which do not respond to or cannot tolerate existing treatment. It is hoped that localised chemotherapy using the new catheter would eliminate the side effects associated with existing treatments.

Dr Panotopoulos has now secured the assistance of the Innovation Relay Centre Network to commercialise his innovation.

(IRC Network, Apr 2006)

ELECTRONICS/COMMUNICATIONS

Consumer Electronics Show 2006

A dazzling array of high tech gadgets, enough to satisfy even the most dedicated technological buff, were on view at the recently concluded 4-day Consumer Electronics Show held in Las Vegas, USA. It was the world's largest technology trade show, and it played host to 150,000 attendees from 110 countries, with 2500 exhibitors.

Bill Gates used the forum to announce a partnership with MTV to sell music content out of Microsoft's next generation operating system Vista. Intel unveiled a new PC platform VIV that combined new chips and software for a faster multimedia experience, while Sony's new CEO let the community know that his company was back on track and would be creating content such as movies, television, books, and serving them on electronic devices like the anticipated PlayStation 3 and the new Sony Reader.

For the child inside every techno-buff, Oregon Scientific unveiled a helmet mounted video camera and recorder powered by 4 AAA batteries. Samsung displayed the world's first 102 inch plasma TV while LG Electronics also put on show a 102 inch plasma screen, and not to be outdone, Panasonic exhibited its own concept plasma screen measuring 103 inches.

In the sphere of wireless technology, Australia's Avega Systems displayed a speaker system costing less than \$500, through which any digital audio source could be fed from a networked PC, while Epos, a digital positioning concern, showcased its Digital USB Flash Drive. This device could be connected to the top of a piece of paper and then one could write or sketch with a bundled digital pen. The written material could then be transferred to a PC via USB and the written notes would be transformed into text.

Motorola displayed its Rocker E2 phone which would allow downloading of songs independently of any PC, while Sirius exhibited a stylish hand held XM satellite radio player which could record 50 hours of programming, and Toshiba put forward an inexpensive \$500 HD DVD player.

(ABC News, Apr 7, 2006)

S&T FOR BASIC NEEDS

BUILDINGS**Construction Innovation**

Trevor Baylis, OBE, who invented the clockwork radio has set up an organisation named after himself to evaluate and source new ideas, and thereby promote the better use of the UK's inventive talent.

Now Trevor Baylis Brands plc (TBB) has teamed up with BRE which develops new construction technology for the active interchange of ideas within the construction industry. An Intellectual Property exchange has been set up where subscribers can review new ideas and technologies, which can then be transferred to industrial partners who are participating in the initiative.

(BRE News, Apr 8, 2006)

Flushless Urinals

The 58-storey Comcast Center building being constructed in Philadelphia, USA, by the Liberty Property Trust and scheduled to open in September 2007, would have had the privilege of being that city's tallest 'green' building, but a controversy has erupted over state-of-the-art 'no flush urinals' proposed to be installed in the building which threatens to derail the entire project.

Liberty Property Trust insists that the devices are cleaner than traditional urinals and would help save nearly 1.6 million gallons of water a year, but the local plumber's union are strongly opposed to the idea, and insist that the devices are dangerous and would spread disease.

A green tag for the building would reap rich dividends for Liberty as the description helps to attract tenants in a highly competitive office market. Energy costs in such structures are generally found to be 45 percent below normal, and green buildings are believed to generate cleaner air which reduces employee sick leave. Even without these flushless urinals, the building would be Philadelphia's most environment-friendly skyscraper, but Liberty believes that the installation of these no-flush urinals would make it the tallest 'green' building in USA.

(ABC News, Mar 29, 2006)

CLOTHING/TEXTILES**Imaged Non-woven Fabric**

A method of forming durable nonwoven fabric by hydro-entanglement has been developed.

This method includes the provision of a precursor web comprising a blend of matrix fibres, and fusible binder fibres. The precursor web is subjected to hydro-entanglement on a three dimensional image transfer device, to create a patterned and imaged fabric.

Fabrics formed in accordance with this invention, exhibit significant improvements in strength while at the same time remaining drapable and capable of withstanding multiple laundry with nominal shrinkage.

The inventors are Samuel K Black and Sergi de Leon, both of USA and the invention has been assigned to Polymer Group Inc of North Charleston South Carolina USA. A US patent for the invention was granted on 7 March 2006.

(US Patent Office, Mar 9, 2006)

Irrigation Systems for Cotton

India has the largest area in the world under cotton cultivation-9.5 million hectares in 2004-05-almost double the 1950-51 figures and 21 percent of the global coverage.

Cotton is a highly water intensive crop and according to one estimate prepared by the FAO, one cotton plant needs 700--1300 mm of water depending on the climate and the growing period. In the early stages the water requirement is 10 percent of this figure, which increases to 50-60 percent when the leaf becomes more dense. At present only 35 percent of the crop is irrigated, and the rest is rainfed.

Now a Maharashtra based manufacturer of micro-irrigation systems has recommended that a shift to drip irrigation can save upto 53 percent of water, and increase the yield by about 27 percent.

Israel has developed the technique of drip irrigation to a remarkable degree and there are a number of lessons to be learnt in this technique from that country.

(Down to Earth, Mar 16-31, 2006)

ENERGY

Harnessing Solar Energy

The US National Renewable Energy Laboratory (NREL) have been working over the last two decades to tap the tremendous potential latent in solar energy through the development of photovoltaic (PV) cells, which are semiconductor devices that convert sunlight directly into electricity. These cells are assembled into flat panels or "modules" which are in turn configured into arrays of virtually any size.

Although PV technology has advanced greatly, it still does not produce power as cheaply as more traditional sources, such as natural gas or coal, mainly because of the high cost of making the PV modules and the effort is now being directed to reduce the costs of manufacture.

NREL has been working with First Solar, a privately held PV module supplier in the development of a new technology for manufacturing PV modules which use cadmium telluride, a polycrystalline thin-film material in the solar cells. Modules made from this material can be linked together in arrays of virtually any size, and may provide just the breakthrough required to make solar electricity commercially viable.

(NREL, Mar 8, 2006)

Wind Energy in UK

A recent study commissioned by the British Wind Energy Association (BWEA) says that Britain's fledgling wind energy industry, consisting of four off-shore wind farms with total 213 MW capacity, is at a critical stage and requires government assistance if the available economic and environmental opportunities are to be availed of.

The study report reveals that an estimated 8000 MW of capacity, equal to 6 % of UK's electricity supply and enough to power 5 million homes could be generated by 2015, but without further support from the government, only 2000 MW was likely to be generated by that time.

The government is currently reviewing the country's energy strategy and its findings are expected to be published this summer.

(BBC News, Apr 8, 2006)

FOOD

Flat Peaches

Years of careful breeding and testing at the Fruit Tree Research Institute in Rome, Italy has led to the growing of a new and improved range of flat peaches, which are valued by customers for their taste and texture.

It is to get over the difficulties of transporting the traditional varieties of peaches over large distances without breaking their skins, that attention began to be focused on developing flat peaches, and finally the efforts have been crowned with success. These flat peaches have been developed after cross breeding several standard varieties and these retain all the sweetness, good flavour and texture of the best variety of traditional peaches. Furthermore, these are easier to pack together and to commercialise for the mass market besides having a very small stone.

This new variety has been christened 'UFO' as it resembles a flying saucer, and it is now being promoted in Spain and other EU countries through the Innovation Relay Centre Network.

(IRC Network, April 2006)

Tomato Extract for Lowering Blood Pressure

A dietary supplement derived from tomatoes which is sold under the brand name of Lyc-O-Mato has been found to help in lowering blood pressure.

Researchers in Israel found that a daily dose of tomato extract helped lower blood pressure in men and women with mild hypertension. On an average, their systolic pressure - the top number pressure reading - dropped 10 points, and the diastolic pressure or bottom number reading also fell significantly.

The tomato extract contains lycopene, an antioxidant which along with vitamins C and E helps neutralise oxygen free radicals that are a natural byproduct of metabolism. These free radicals are believed to contribute to a range of chronic diseases including high blood pressure and heart disease.

(Health News, Jan 15, 2006)

HEALTH**New Health Projects in Developing Countries**

The InterAcademy Medical Panel (IAMP) which is made up of 51 medical academies and the medical wings of scientific and engineering academies recently announced in Beijing, China, that four new health projects would be undertaken in developing countries by the global network of scientific academies, which would focus on studying endemic health problems and training young scientists to tackle them.

One project would develop better ways of dealing with rheumatic fever which is rampant in African countries and would rely on experts from African science academies. Another would study infant mortality and methods to eliminate it. A third would analyse the effectiveness of networks that monitor emerging diseases in developing countries, while a fourth project will run a series of regional workshops to help young researchers to improve their science communication skills.

The IAMP has also agreed to support the Diseases Control Priorities Project which aims at helping developing countries maximize the returns on their investments in health.

(InterAcademy Medical Panel, Apr 6, 2006)

Treating Drug Resistant TB

Studies conducted by the University College London Medical School indicate that the main treatment of drug resistant TB could increase the appearance of resistant bacteria if used inappropriately.

Quinolones are antibiotics used to combat strains of TB bacteria that are resistant to conventional drugs, but if the dose is inadequate and the bacteria are not killed, the rate at which its DNA mutates goes up 120 fold, increasing the chances of it evolving into a form that can resist quinolones entirely, regardless of the dosage.

The researchers say that this points to the need for adhering to the right dosage, which poses a challenge in developing countries where patients often stop taking the medicine before completing the treatment.

(SciDevNet, Apr 5, 2006)

TRANSPORTATION**Building Bridge in Record Time**

Bridges are vital for speedy and efficient transportation, and now the use of innovative new materials in bridge construction promises to do away with the months and years that were often taken on the job.

Prefabricated plates made of fibreglass polymer composites which are light in weight and easy to transport have been successfully used in USA to replace the conventional steel girders in bridges which took ever so long to position and then build upon. These fibreglass composites are strong enough to withstand several decades of heavy traffic and unlike steel, are also able to resist the ravages of salt and corrosion.

The technical and economic feasibility of this new material for building bridges having been demonstrated, the task is now to modify the construction standards to allow for the use of this innovative new material. Meanwhile the bridge which has been renovated with the use of this material has received a grant from the US Department of Transportation.

(US National Science Foundation, Apr 9, 2006)

Recycling Tyres into Roads

Pennsylvania State in USA is trying to put waste tyres to good use.

Its Centre for Dirt and Gravel Road Studies has received a hefty grant from the State Department of Environmental Protection to use waste tyres to improve dirt roads that are silting up local waterways. Nearly half a million discarded tyres will be used in a demonstration project out of a stock of about 6-8 million such tyres.

The tyres will be formed into 2.5 by 4.5 by 5 feet blocks each containing approximately 1000 tyres, and will then be used to fill the roads. They will incorporate drainage structures to channel runoffs into the surrounding vegetation areas, rather than allowing them to flow down the road into the streams, and if the project is successful, it will open up a whole new way of utilising the millions of tyres that Americans discard each year.

(EurekAlert, Apr 8, 2006)

SPECIAL FEATURE

ASSESSING EUROPEAN COMMISSION INNOVATION PROGRAMMES

Background

A study was recently conducted on behalf of the Directorate General, Enterprise and Industry of the European Commission on the monitoring and evaluation of innovation programmes. One of the main goals of the project was to identify opportunities for the European Commission to encourage future evaluation practice in the innovation programme field. The methodology involved the preparation of case studies of evaluation in specific countries and regions; interviews with experts in the area; and the establishment and analysis of a database of examples of innovation programme evaluations from which useful lessons could be gleaned.

Through the seven case studies that were prepared, certain patterns in the evaluation of innovation programmes were visible, both in terms of space as well as in time. Spatially, three different cultures of innovation were identified viz. countries such as Finland and Sweden, where evaluation forms a central element in innovation programmes; other countries such as Germany where evaluation is used as a learning tool to strengthen innovation but in the area of programme design and much less in policy formulation; and a third set of countries such as Hungary and Spain where evaluation has so far not been greatly developed or implemented.

This article focuses on the German experience and the lessons that could be learnt about fostering innovation, from that country.

The German Experience

Germany was found to follow a more diverse and modular approach to evaluate innovation than any of the other countries in the study and indeed nowhere more than in Germany was evaluation described as a learning process. Three specific issues were raised in the German context:

- Each individual innovation is, by definition, always shifting forward to a new and specific business model.

Although there is no certainty that the new proposed business model and system would be successful, there is need to develop tools and skills to translate the innovation specific basic uncertainty into risk management procedures.

- Innovation capacity building involves learning how to innovate. Hence an innovation programme is expected to promote some sort of learning or change of behaviour. However, learning to increase innovation capacity is different from studying a university curriculum as there are none of the structured reference points which are generally available in a university course of studies.
- Government intervention to support innovation capability should be limited to situations where there is market or system failure and only if the state has a chance to do better than the market should it attempt to design a suitable mix of institutions and policy instruments. The innovation capability of the regulatory framework should be systematically evaluated through assessment of the laws and regulations at national and international or transnational level, and public efforts should become supportive of the innovation capability of the market economy.

Increasing Divide

The German study reveals that there is an increasing divide between experts and researchers on the one hand who are rapidly developing new in-depth analyses of innovation processes, and "traditional" views that were taught in universities years back, on the other. Politicians correctly assume that research has not yet been able to provide a comprehensive framework to capture the essence of innovation; the innovation environment and innovation capacity building. What is therefore needed is to bring closer academic research with policy design. Policy makers could profit from the very strong domestic research capacity that is available and complement this with the conclusions of mutually leaning groups to support the transition from a classical manufacturing economy to an innovation economy.

Principle of Government Intervention

An enterprise's economic performance depends largely on the national and international framework

conditions and institutional settings. It also relies heavily on its own way of doing business. Government is not necessarily justified in undertaking responsibility for business promotion, and the view posited in the study that only in the case of market failure, and only if the state has a chance to do better than the market should it attempt to design a mix of policy instruments, has already been referred to. In this background there are three policy levels where support for innovation performance can be forthcoming:

- Firstly, innovation capability is based on the enabling and hindering features of the regulatory framework which to a large degree would determine the level of support.
- Secondly the innovation capability of the market economy has to be fully understood and improved to enable it to respond and adjust suitably to innovation performance through financing, fiscal stimuli etc.
- Thirdly the innovation capability of government relies on incentives provided by governments' services or agencies using appropriate implementation channels aimed at increasing the efficiency of intervention.

Evaluation as a Policy Tool

The study emphasizes that policy design should be nurtured by evaluation procedures: the selection of policy options should be based on an evaluation of the legal environment, monitoring of the impact of framework conditions; an economic assessment of the potential impact of innovation support measures and finally an economic assessment of the impact delivered or achieved through a given measure. Before conducting any evaluation, the rationale for doing so must be very clearly defined, and whatever the available options for evaluation, the need for highly documented communication material is unquestioned.

The study notes that the financial markets and banks play a major role in resource allocation for innovation and if the evaluation is based on wrong or misleading criteria, the innovation would fail to attract adequate funding.

Managing Uncertainty and Risk

Although innovation is always creating new business models, evaluating innovation performance would by itself not guarantee the success of the innovation.

However, the regular availability of human resources and consistency of strategy can help convert the basic uncertainty of an innovation project into more of a risk management venture. Similarly, at global level, a policy that rates the various available options in respect of government projects would be useful in assessing the trade off between legislative reform to improve market conditions and providing direct support.

Modular Approach for Evaluation

As several methodologies are available for evaluation, the study notes that the German evaluators support a modular approach which allows each programme manager or policy maker to initiate the process of evaluating their own programme or activity whenever they wish. Such an approach can also help to provide a consistent framework, where each evaluation becomes part of a broader, integrated evaluation system where information and knowledge continually cumulate on a permanent basis.

"Evaluability"

Defining the desired goals, and identifying the indicators which have to be implemented for achieving the outcome forms an important part of innovation performance initiative, and to achieve this, it is necessary to move away from the traditional practice of command and control towards a "formative" evaluation culture.

Impact of Innovation on System Learning

As innovation means a way of producing a new thing, or to produce an existing thing in a new way, it can occur only once and if it is replicated it becomes only a copy. Who then can evaluate the proper mode of learning when no specific guide posts are available? According to the study, the evaluation should cover the entire spectrum of the value chain, and at the end of the process all should share the same vision of the benefits of the evaluated initiative.

Conclusion

This study brings out the important truth that innovation evaluation is not something that can be fastened onto the programme once it has been completed. But has to be firmly embedded in the policy and programme design from the very start, and has to be integrated into the learning experience.

IN FOCUS

R&D SCORECARD 2005

Background

Continual Research and Development is perhaps the most important requirement for innovation. Since the last few years, the UK Government has been publishing an annual 'Scorecard' on R&D activities of the top 1000 global companies and the top 750 companies of the UK. The R&D Scorecard for 2005 contains details of R&D investment, Capex sales, profits, employee numbers, market capitalisation, and key financial ratios for UK and global companies extracted from their annual accounts and compares them with the figures for previous years. It presents a graphic picture of countries and companies which are forging ahead in the race to innovate new products, processes, procedures and methodologies.

Overall Perspective

Globally, during 2005, the business climate for R&D companies continued to improve in all regions but most rapidly for companies from North America. The top 1000 R&D investing companies, all with over £22 million expenditure on R&D, spent £20 billion. Similarly, the top 750 UK based companies each of them spent at least £300,000 on R&D during the year, and cumulatively £17 billion.

Eighty-six percent of total R&D remained concentrated in 6 countries, namely USA, Japan, Germany, UK, France and Switzerland, but South Korea and Taiwan were catching up fast. South Korea was now the eighth largest country in terms of R&D spending with a 40% increase over the previous year. The Scorecard shows that there is so far no evidence of substantial investment in R&D by Chinese or Indian companies.

Sectorwise, the largest 3 R&D sectors were automotive, IT hardware and pharmaceuticals. Seven sectors namely, aerospace, automotive, chemicals, electronics, pharmaceuticals, IT hardware and software accounted for 82 percent of R&D expenditure and pharmaceuticals, automotive and aerospace sectors grew the most rapidly among the top ten sectors.

The top 100 companies accounted for 64% of R&D spending, while the bottom 200 companies were involved in only 2.5% of global R&D.

R&D by Country and Sector

R&D was found to be concentrated in the largest countries, sectors and companies, but the six major countries had very different R&D specialisations and different proportions of R&D intensity as opposed to capex intensity or service segments in their economies. Thus USA had a major presence in pharmaceuticals, IT hardware and software (85% of software sector R&D continues to be located in USA); Japan was strong in the automotive sector; while UK specialised in pharmaceuticals and aerospace as well as in low intensity sectors such as food production, oil & gas and utilities. UK also had a growing software sector and was becoming an increasingly attractive investment destination for large foreign R&D investors.

The scorecard reveals that the sector mix impacted decisively on average R&D intensity, the patent to R&D ratio, and the dividend to R&D ratio for a country. UK, with its relatively larger presence in low intensity R&D sectors had an average R&D intensity of 2% which was less than half that for USA (4.5%) and half that for Japan (4%). Nine times as many patents were issued per 10 million pound in high intensity R&D areas, such as IT hardware and electronics, as compared to lesser intensity areas such as pharmaceuticals. The ratio of dividends to R&D also varied greatly, with high value/low R&D sectors having the highest ratio. UK had many companies of this type, whereas Japan and Germany had more strengths in R&D intensive but less profitable sectors such as electronics and the automotive sectors.

The rate of R&D growth in the top ten sectors also varied greatly with pharmaceuticals, aerospace, automotive and health sectors registering above 6 percent growth rate over the previous year. Hence, for each country the particular sector mix determined the rate of R&D growth to a great extent, with R&D in the USA (7%), Switzerland (10%) and South Korea (40%) growing the fastest.

R&D by Company

The USA has, by R&D, 6 of the largest companies; 6 of the top 10 larger companies by growth of R&D; and 11 of the top 15 companies by R&D intensity. Similarly, Europe has 6 of the top 15 by R&D but only 1 of the top 10 by growth; and 4 of the top 15 by intensity.

Company Performance

The scorecard also brings out the close links between R&D and company performance and market capitalisation.

PERSPECTIVE

AUSTRALIA REACHES OUT

Backdrop

Australia's population is overwhelmingly of European descent, but its unique geographical position at the southern rim of Asia gives it an unrivalled opportunity to act as a bridge between the West and Asia. Indeed many thoughtful observers in that country are of the view that Australia's destiny ultimately lies with Asia, and little wonder then that in a variety of ways it is reaching out to India and China, both rising Asian powers which are destined to play a prominent role in world affairs as the present century unfolds.

One such initiative is the Australia-India Strategic Research Fund which is currently in an advanced stage of development. It will provide up to \$20 million of Australian funding over five years, commencing in financial year 2006/07, for collaborative research activities between Australia and India. The funds will be used to finance Australian participation in scientific symposia, and bilateral projects in mutually beneficial priority areas.

Australia - China Scientific Cooperation

However, it is with China that Australia's policy of reaching out has made considerable headway. In May 2004, the Australian Prime Minister announced a policy called 'Backing Australia's Ability', which seeks to build the country's future through science and innovation by investment of \$5.3 billion. As a part of that policy, \$92.7 million was to be provided over 9 years to support international collaboration through the International Science Linkages (ISL) Programme.

The ISL which builds on the former Innovation Access Programme (IAP) and became fully effective on 1 January 2005, supports Australian scientists from both the public and private sectors to collaborate with international partners on leading edge science and technology in order to contribute to the region's economic, social and environmental well being.

An important component of ISL is the Australia-China Fund for S&T Cooperation. Both Australia and China realise the importance of strengthening the links

between their science sectors, and this Fund supports collaborative research and technological cooperation between scientists of the two countries in both the public and private sectors. The Fund is jointly managed by the Australian Department of Education, Science and Training (DEST) and its Chinese counterpart, the Ministry of Science and Technology (MOST).

Support Available

The Fund will provide financial assistance on a competitive basis for participation in international collaborative scientific and research projects that seek support from eligible activities and which meet the objectives of the ISL programme. In particular, the Fund will meet the expenses incurred over international networking which includes international travel and living expenses associated with participation in collaborative scientific research and technology projects; and project-specific organisation and logistical costs. The Fund would also meet the expenses incurred over showcasing, including space rental, design, and construction of such facilities, project management, administration and logistical costs.

Support to Chinese applicants will be provided by the Chinese government while for Australian applicants it will be provided by DEST.

Projects

Projects may range from short international visits or activities to more complex projects spanning up to 3 years. Projects, however, cannot extend beyond the life of the ISL programme (June 2011).

As it is a joint Australia-China Fund, applicants must seek funding for collaboration with a partner. Both the Australian and Chinese partners must submit an application to their respective governments.

The Way Forward

Australia-China scientific and technological cooperation is steadily strengthening. After the Treaty on Cooperation in S&T 1980, and the MOU on Cooperation in S&T of 1989, the MOU on establishment of this special Australia-China Fund marks another step forward in the growing links between these two countries for the advancement of science and innovation to the benefit of both their peoples.

TECHNOLOGY DEVELOPMENT

R&D COMMERCIALISATION

Glass that Picks Up Vibrations

Glass panels have been developed which can actually talk!

The technology developed by a French company Intelligent Vibrations (I-VIBE) is based on acoustic waves. The panel which can be several square metres in area has a tiny sensor in each corner that can detect bulk acoustic waves from the noise made by tapping it or from a human voice. The sensors are wired to a computer that works out the point on which the glass is being tapped. Even the most minute vibrations can be detected unaffected by background noise and the system has now been so refined that a glass window fitted with the sensors can pick up a voice from across the pavement. The sensors can also be reversed so that the window acts like a microphone and talks to the user.

The effort now is to turn the intelligent window from vertical to horizontal to form a table which can act as an information panel, suitable for bars, hotels, etc.

Steps are being taken to commercialise this product and several companies have expressed interest, as they see a variety of uses for it.

(IRC Network, Apr 2006)

Licensing Survey Report 2004

The Association of University Technology Managers, (AUTM), the premier non-profit association of academic technology transfer professionals in USA, has just released its Licensing Survey Report for 2004 which provides the latest available information about licensing activities at universities, hospitals, and research institutions across North America.

The survey results have shown a continued growth in the technology transfer fields and most dramatic has been the number of new companies based on academic research which were launched that year. Research funding in 2004 was up by 7.1% compared to the previous year, and 462 new companies based on academic discovery began operations in North America during that period.

(AUTM News, Apr 8, 2006)

Making the Blind Visible

An innovative cane which is illuminated has been developed which can help the blind and partially sighted people easier to be seen by road users and other pedestrians, and thereby reduce accidents.

This folding cane, which has been named Vizcane, and is made out of polycarbonate has been patented by a UK company, Somerwood Ltd, but is to be manufactured in Hungary by a company called Ferrit-Elektro in a co-development deal brokered by the Innovation Relay Centre Network.

The two British innovators who developed the cane came across the idea while visiting friends in Denmark. When they saw the prototype there, which featured lights on the handle, they immediately spotted the potential of the idea which could change the lives of the 10 million blind and partly sighted people in Europe alone and a similar number in North America. They invested their own money from the sale proceeds of a house to develop the project further.

For Ferrit-Elektro, working with high purity polycarbonate, high precision tube extrusions and combining mechanical manufacturing with highly sensitive electronics represents the greatest challenge in the company's history.

(IRC Network, Apr 9, 2006)

Shotgun Licensed for Production

A breaching shotgun, a combination of two firearms in one, a 12-gauge shotgun used to blast away doorknobs or hinges and a powerful rifle to deter and detain suspects, has been developed by US Department of Energy's Idaho National Laboratory. It has been licensed to be manufactured by an Idaho based company.

The firearm is proposed to be made a trusted tool for the entire law enforcement and military communities and is expected to save lives during high risk operations such as hostage rescues and drug raids.

This weapon was a collaborative project that involved several engineers and designers within the laboratory and each member of the team had a specific expertise from firearm design to law enforcement policy chamber.

(DOE News Release, Mar 8, 2006)

INTELLECTUAL PROPERTY

Protecting IP in China

In an article that has recently appeared in the McKinsey Quarterly, the authors criticise China for relying too heavily on legal tactics to protect their intellectual property instead of formulating a well thought out strategy.

After studying the Chinese operations of ten multinationals, competing in the IP intensive sector which includes consumer electronics, medical equipment, pharmaceuticals, semiconductors, and software, the authors found that the Chinese executives relied much too heavily on legal remedies, and that too after the property had been stolen. A few companies had, however, taken strategic and operational decisions to protect their IP and thereby had not only reduced their litigation costs but had reduced the chances of it being stolen. This was done by making a careful selection of products and technologies to be sold and manufactured in China. The article cites the case of one pharmaceutical company in China which withholds its most innovative high margin drugs from the Chinese market altogether and introduces only low-margin products such as mature, off patent drugs that are sold over the counter.

The article points out that the recent enactment of a stronger statute on IP rights in China should provide better legal protection, but litigation is no substitute for strategy. In this connection, the article refers to some of the practices adopted by companies for protection of their IP rights. One global company prefers to recruit employees with international work and educational experience, which it hopes would foster a greater respect for IP. The company reinforces IP awareness by requiring non-compete clauses (which prevents employees from serving competitors for upto three years) in employment contracts. Screening of all job candidates for high ethical standards, cultivation of IP awareness among its employees, use of surveillance equipment, and fire walls to prevent large file transfers, registration of trademarks and patents with local authorities and prosecuting violators with appropriate vigour and prudence are some of the other measures adopted by alert companies to protect their IP.

(McKinsey Quarterly, Apr 9, 2006)

Rush for 'eu.Domain Names

When registration opened for new "eu" domain names one Friday morning early in April, over half a million Europeans had signed up for the new Internet addresses by mid day.

Until that day, registration was limited to specific groups such as registered trademark owners, public bodies, and companies but now anyone who resides in the 25 member European Union can buy a name on a first come, first served basis.

EU Commissioner Viviane Reding said that the Commission hoped that the new "eu" name would one day rival the ".com" name.

Before the creation of "eu", Europeans had to chose between a national domain such as ".fr" France or a global one such as ".com" which was perceived as something American.

The Internet Corporation for Assigned names and Numbers (ICANN) is now considering a "Asia" name for those residing on the Asian continent.

(abc News, Apr 7, 2006)

Standing Patent Rule Reversed

In the USA till the other day it was relatively easy to sue a company on the allegation that it was illegally tying the sale of its patented product to other products that it sold, assuming that the patent gave the company monopolistic power.

That legal doctrine was recently reversed by the US Supreme Court in a case filed by a small California Company, Independent Ink which alleged that a subsidiary of Illinois Tool Works had illegally required buyers of its patented printheads to use its ink to fill them.

Illinois tool had won the case in the Federal District Court, but the Court of Appeal partly reversed the judgement, citing the precedent that holding of a patent automatically conferred market power. The Supreme Court however held that, in all cases involving a tying arrangement, the plaintiff must prove that the defendant has market power in the tying product. The case was remanded to the lower court saying that for Independent Ink to prevail it would have to prove that Illinois tool had market power.

(New York Times, Mar 5, 2006)

TECHNOLOGY FUNDING

EU Telecom Sector Attracts Innovation

According to a recent report of the European Commission, the prospects look good for investment and innovation in the EU telecom sector.

In particular, the report highlights the rapid rise of broadband Internet connections in Europe and the rapidly maturing market for mobile voice services where significant growth is now mainly in the new Member States. In the EU as a whole, mobile phone penetration has reached almost 93 percent, touching 100 percent in 8 Member States.

A number of EU countries have already transposed virtually all the EU telecom rules into national law, while the remainder have made substantial progress.

While the progress made in opening up national telecom markets has been welcomed, it is realised that further work is still needed. The report also highlights the need to reduce international roaming charges when using a mobile phone abroad; to raise awareness of Europe's 112 emergency number; and to avoid burdening emerging internet telephony services with excessive regulation.

(CORDIS, Mar 9, 2006)

Funding for Technology Projects

In his budget Speech to the UK Parliament, the Trade Secretary Alan Johnson announced that UK business would get 80 million pounds as part of the Government's 370 million pound Technology Programme that aims to create wealth for the UK economy through innovation.

The funding will be used to support collaborative research and development in seven key technology areas identified by the Technology Strategy Board as critical to the UK's growth.

The strategies provide a focus and create a dialogue for going forward in areas where UK business can succeed. As each area evolves, new challenges and opportunities are expected to emerge through research, networking, regulation, standards and measurements and procurement.

(UK Dept of Trade & Industry, Mar 29, 2006)

SuperPower Awarded Contract

Intermagenerics General Corporation's energy technology subsidiary SuperPower Inc announced that it has been awarded a \$10.7 million follow-on contract from the US Department of Defence Title III programme to underwrite partially the cost of R&D for second generation high temperature superconducting (HTS) wire development.

The Title III programme was established by the Department of Defence and is co-funded by the US Department of Energy with the objective of developing domestic second generation high temperature wire manufacturing capability that can provide sufficient high performance wire for military and commercial applications.

The 50% cost-sharing funding is being provided through the Air Force Research Laboratory. SuperPower Inc expects its R&D expenses under Phase 3 of the Title III programme that will run till June 2008 to amount to approx \$ 10.7 million.

(Biospace, Jan 4, 2006)

USA to Cut R&D Spending

An analysis by the American Academy for the Advancement of Science (AAAS) finds that President Bush's 2007 budget proposals would lead to cuts of as much as 30% in the research projects of federal agencies over the next five years.

Thus the National Institutes of Health R&D budget would decline every year up to 2010 before rebounding slightly in 2011. In all NIH's R&D budget would fall 12.1% in real terms between 2006 and 2011. Similarly, Pentagon research would fall 11.6% below the current budget after inflation by 2011.

According to the analysis, the proposed 2007 budget would leave the federal research portfolio 8% below the 2004 level in inflation adjusted dollars. Thus all R&D funding agencies except NASA, NSF, NIST and DoE Science would see their budgets decline in real terms over the next five years.

Meanwhile, nearly a dozen bills have been introduced in the US Congress expressing concern about the state of US innovation and the nation's competitiveness in the global economy.

(AAAS, Apr 7, 2006)

EXPERTS CONVERGE

CANEUS 2006

CANEUS is the world's foremost international conference on Micro-Nanotechnology (MNT) development for aerospace applications.

This year's conference will build on the themes developed during previous successful conferences, namely the challenge of rapidly and efficiently transitioning aerospace MNT development from a relatively low technology-readiness level stage to system-level implementations. It will thus explore the formation of an integrated "womb to tomb" approach for aerospace applications.

The conference format is arranged to provide each participant with maximum exposure to developments in the areas of emerging MNT concepts; MNT system development; mature systems and sub-systems; end-user needs and perspectives; investment perspectives and roadmaps; governmental policies and their impact.

The conference will consist of individual sessions as well as general participation in 'Contributed' and 'Invited' oral presentations, and focused workshops on several high priority issues.

(CANEUS 2006, Apr 9, 2006)

Workshop on Mercury Risk to Health

South Africa's Council for Scientific and Industrial Research (CSIR) recently hosted a workshop on the risks associated with mercury usage.

The workshop was attended by participants from the South African Departments of Tourism and Water Affairs, the Basel Convention; and the Universities of Stellenbosch and Witwatersrand, besides others.

Topics discussed included the Global Mercury Cycle and Its Impacts; the Basel Convention; Mercury pollution and its risks to health, water co-systems etc.

The participants brainstormed a preliminary draft plan for preparing a comprehensive base line study about the mercury situation as it affects different population groups which could lead to the preparation of detailed health advisories.

(CSIR, Apr 14, 2006)

KNOWLEDGE SPREADS

Age -Related Depression

A recent study report published by the University of Edinburgh, Scotland, has for the first time identified certain areas of the brain which shrink with old age and cause depression and Alzheimer's disease.

The researchers examined the size of a special region of the brain, the anterior cingulate cortex, that might be involved in controlling stress hormones, and found that people with a similar anterior cingulate had higher levels of stress hormones.

According to the lead author of the report, Dr Alasdair MacLulich, for the first time it has been possible to show that increased levels of stress hormones may cause shrinkage of critical areas of the brain, and this will help in the development of treatments based on reducing high levels of stress hormones.

(Communications & Pub. Affairs, Feb 27, 2006)

Creating Competitive Advantage

Books and articles about new marketing strategies are being spewed forth in ever increasing numbers, but the basic question as to "Why should I do business with you and not your competitors" still remains to be answered satisfactorily.

Now here comes a book with the title 'Creating Competitive Advantage' written by Jaynie L Smith which attempts to answer just that question.

The author says that while researching her material she found that only 2 CEO's out of 1000 could clearly identify the competitive advantage their companies provided and all the others offered vague genialities.

Her book identifies 5 flaws which represent a challenge to vendors, namely they don't have competitive advantage but they think they do; they have competitive advantage but don't know they do and therefore they lower their prices; they know what their competitive advantage is but do not inform their clients about it; they mistake 'strengths for competitive advantage; and they do not keep their competitive advantage if any in view while taking decisions.

(Industry Week, April 2006)

SCAN AROUND THE GLOBE

New Solar Energy Centre

A new \$5.3 million National Solar Energy Centre located at the CSIRO's Energy Centre at Newcastle, New South Wales, Australia, which is the only multi-collector facility of its type in the country, and has the only high-concentration solar array in the Southern Hemisphere was inaugurated by the Australian Minister for the Environment recently. This facility has the following three elements:

- A high concentration tower solar array that uses 200 mirrors to generate more than 500 KW of energy.
- A linear concentrator solar array that generates a hot fluid at temperatures of about 250 degrees C.
- A control room facility that will house the centre's communication and control systems and serve as an elevated view.

The Centre is expected to showcase solar thermal technologies and play a key role in CSIRO's research into efficient generation. This type of solar thermal technology draws on solar energy and natural gas, and will enable the production of Solargas, which generates 26% more energy than natural gas.

This project is supported by the International Science Linkages program.

(Australia - CSIRO, Mar 31, 2006)

Science & Technology in Botswana

The Botswana National Research Science and Technology Plan which was commissioned by that country's Ministry of Communications, Science and Technology, has responded to several socio-economic challenges presently facing that country, including economic diversification, poverty and the use of natural resources.

The Plan has identified several priority research areas for meeting Botswana's national goals such as energy, agriculture, housing and construction, education and human resource development, health and eco-and cultural tourism. It also describes how the plan is to be implemented, which includes the creation of new funding and research agencies.

Among the various conclusions, the study has highlighted some of the key features, in Botswana's efforts to encourage science and technology, including its national system of innovation, a significant number of female researchers and relatively low expenditure on experimental R&D.

(Botswana - *csir.co.za* Apr 8, 2006)

Devouring the Amazon

The Environmentalist Organisation, Greenpeace has warned that multinational super market and restaurant chains, such as MacDonald's are literally devouring the Amazon rain forest as they clear the land to grow soya beans which serves as feed for chicken.

Much of soya bean cultivation in the Amazon is illegal, as environmental regulations require 80% of the land to remain forested, but the regulations are ignored, and the cultivation is done by using "debt slaves", that is poorly paid workers who are compelled to pay exorbitant prices for even daily necessities which keep them perpetually in debt.

(Brazil - *ABC News*, Apr 7, 2006)

Combating Disease in South America

Diseases such as malaria, meningitis, cholera and TB are making their appearance again in different parts of the world, and recently the Canadian National Research Council organised a four day international workshop which focused on improving human vaccine development and global vaccination networks.

The workshop saw several disease scientists, regulators, and business people from South America as well as Canada meeting on a common forum.

Several issues were discussed, including the challenges posed by commercialisation, the need for greater harmonization of the regulatory process and measures necessary to ensure that vaccines remained affordable and met high quality standards. Valuable insights were offered by the participants, particularly those from Canada. The participants also recognised the importance of an institutional mechanism for sharing information between nations to advance research in infectious diseases more rapidly.

(Canada - *NRC*, Apr 9, 2006)

Micro-Robot

The Institute of Process Control Karlsruhe, Germany, has developed a tiny robot which has the ability to move, and work successfully in medical, micro-assembly and atomic force experiments.

The robot measures about 1.5cm by 3cm. It is designed to be complete in itself, with different kinds of actuators for gripping, cell manipulation, etc. The robot is controlled by a special positioning system, which could view it from 40 to 50 cm above. While the robot does not know where it actually is, it knows in which direction it is moving.

This robot has been developed as part of the MICRON (Miniaturised Co-operative Robots advancing towards the Nano range) project funded under the information society technologies (IST) priority of the Sixth Framework Programme (FP6). Initially, the plan was to develop a series of five robots, but this could not be done within the prescribed three-year timeframe because of the complexity of the task.

The robot has been shown as capable of cell injection as also micro-soldering. The scientists now propose to build robots with 'swarm' intelligence, that is with the capacity to communicate with each other.

(Germany - *CORDIS*, Mar 8, 2006)

Glasses That Hear

Spectacles with hearing aids concealed in each leg of its frame have been developed in the Netherlands, which are aesthetically pleasing and surmount the technological limitations of traditional hearing aids.

These spectacles, known as Varibel, has a row of four tiny interconnected microphones which selectively intensify the sounds that come from the front while dampening the surrounding noise. The result is a directional sensitivity of +8.2 dB in comparison with which regular hearing aids have a maximum sensitivity of +4 dB. The user can separate the desired sounds from the undesired background noise.

With Varibel, natural sounds can be heard clearly in the direction in which the person is looking.

(Netherlands - *EurekAlert*, Apr 8, 2006)

Advancing Public Sector Innovation

A report prepared by a Norwegian Research Institute, has emphasised that innovation must be a human phenomenon and not an activity restricted to the private sector.

The report claims that contrary to public perception, there is a lot of innovative activity taking place in the public sector but several barriers do remain, which include the size and complexity of public sector organisations; risk aversion; a heritage and legacy that leaves public sector entities prone to hidebound practices and procedures; need to carry out consultations on any planned change, absence of capacity for organisational learning; potential public resistance to change, technical barriers and absence of resources.

The report emphasises that an organisation wishing to be more innovative, should ensure that it has political push, a culture of review, support mechanisms for innovation, capacity for innovation, competent drivers, an interest in technological innovation, and models developed by private companies and non-governmental organisations (NGOs) besides tackling the barriers specifically outlined above.

The report was prepared as a part of the Publin Project funded under the EU's Fifth Framework Programme (FP5).

(Norway - *CORDIS*, Mar 9, 2006)

Boeing Agrees to Pay Hefty Fine

Boeing company, the giant US aircraft manufacturers have agreed to pay a \$15 million fine to settle US government allegations that they broke the law by selling commercial airlines equipped with a chip that has military applications.

The chip is a part of a back up system that maintains an artificial horizon for pilots and sells for less than \$2000. Boeing officials argued that any enemy wanting the chip had the option of buying the jet and taking apart the flight box, but the state department was not impressed with this argument, and asserted that Boeing's sales were not licensed, and 19 of the planes went to china where the US export of listed defence items is specifically prohibited.

(USA - *Canada.com*, Apr 9, 2006)