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developing world Over 2 billion people in the world are without electricity, and thus, a safe and effective source of light. They still rely on kerosene and fuel wood for both light and power. Not only are these sources of power and light dangerous because of the fire hazard and the noxious fumes that go hand-in-hand with combustion, but they are often of a low quality. That is, children who work the entire day to sustain themselves and their families are unable to attend school at night due to the practical limitations of the light sources. Thus, the cycle of poverty continues. To learn more about the Light Up the World project visit [www.lightuptheworld.org](http://www.lightuptheworld.org)

## WESTERN INDUSTRY FORUM ON PROFESSIONAL DEVELOPMENT

Presented by APEGGA, CCPE  
and CSEM

Date: Thursday, January 31, 2002

Place: Fairmont Palliser Hotel,  
Calgary, Alberta

Registration: \$200 until  
January 2 and  
\$250 after January 2

A networking and learning opportunity with leading industry representatives who will address how to identify profession development needs for engineers.



## 2002 CALL FOR ENTRIES

The Canadian Council of Professional Engineers invites entries for the 2002 CCPE National Scholarships. Six cash prizes totaling \$55,000 will be presented to worthy Canadian engineers in support of advanced studies and research.

To be eligible, candidates must be registered as full members (P.Eng./ing.) with one of Canada's provincial or territorial professional engineering associations/ordre.

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Deadline for applications in all categories is April 1, 2002.

Scholarship application forms are available by clicking on the above links, or from:

CCPE National Scholarship Program  
Canadian Council of Professional Engineers  
180 Elgin St., Suite 1100  
Ottawa, ON K2P 2K3

Tel.: (613) 232-2474, ext. 246  
Fax: (613) 230-5759  
E-mail: [member.services@ccpe.ca](mailto:member.services@ccpe.ca)

*CCPE thanks ENCON Insurance Managers, Manulife Financial, and MELOCHE MONNEX INC. and its subsidiaries, Monnex Insurance Brokers Limited and J. Meloche Inc., for their support of the CCPE National Scholarship Program.*

# The CSEM Newsletter

CSEM's mission is to represent the interests and enhance the capabilities of engineers in management in order to advance and promote efficient management of commerce, industry and public affairs.



Canadian Society for Engineering Management  
Société canadienne de gestion en ingénierie

December 2001  
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A member Society of the Engineering Institute of Canada



Une société adhérente à l'institut canadien des ingénieurs



CSEM President,  
Gordon Thomson,  
P.Eng., LL.B., FEIC.

## From the President

In this edition of the CSEM Newsletter I have decided to profile groups of engineers that are attempting to bridge the technology gap between developed and developing countries. My motivation for doing so is derived from the book entitled "*The Ingenuity Gap*" by Thomas Homer-Dixon published by Vintage Canada, a division of Random House of Canada. This book was the winner of the 2001 Governor General's Literary Award for Non-Fiction and is a national bestseller. I highly recommend it as reading for engineers.

The main theme of the book is that humanity is facing a number of severe global environmental stresses that are causing numerous technical and social problems. To solve these problems, humanity will need more ingenuity. However, both rich and poor societies do not always have the right amount and type of ingenuity at the right time and place to solve problems. Therefore, there exists an "ingenuity gap" between supply and demand for solutions to problems. This gap is more acute in poorer countries. The book defines two types of ingenuity: technical and social. Technical ingenuity provides the technical solutions to the problem. Social ingenuity is the ability to

implement technical solutions in a timely manner. The former may exist but without the latter the problems remain. Mr. Homer-Dixon does not single out the engineering profession for praise or condemnation. However, it is clear from reading his book, that a great portion of bridging the "ingenuity gap" will fall to the engineering profession in both technical and social contexts. Engineers will be increasingly challenged to find solutions to seemingly insurmountable problems. The greater challenge will be communicating these solutions to decision makers and the public in a manner that is comprehensible and garners acceptance.

At the last EIC Council meeting held in Ottawa on November 3rd, Council was introduced to a group called Engineers Without Borders (EWB). Its mission is to improve the quality of life of people in developing nations and communities by helping them find technical solutions to their problems. EWB provides opportunities for practicing engineers, retired engineers and engineering students to work on projects in developing nations. Another group that presented at the Council meeting was Registered Engineers for Disaster Relief (RedR). RedR is an international organization working to save lives and reduce suffering by providing engineering expertise and support to relief agencies like the Red Cross and CARE. Finally, I learned about the upcoming Globe 2002 Conference

on business and the environment to be held in Vancouver in March 2002. One of the main themes of the conference will be the environment and energy.

I believe that engineers have a duty as professionals to promote a personal ingenuity agenda through continued professional development on technical and social issues. As individual citizens, engineers are best equipped to understand the technical problems and provide solutions. Continued advocacy and promotion of ingenuity, innovation and entrepreneurship to decision makers is important. CSEM continues to support the "ingenuity agenda" by offering professional development to engineers in management, leadership and problem solving.

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# GLOBE 2002

March 13-15, 2002

Vancouver, BC

**E**ntering an era distinguished by energy strategies in the Americas and an increasing global commitment to equitable and inclusive sustainable development, governments and corporations must become increasingly receptive to the forces of change. From March 13-15, 2002, international leaders in the business of the environment will convene in Vancouver to discuss how major developments in energy policy

and sustainable development can be translated into technology solutions and business opportunities. Recognizing globalization as a leading force in business in the 21st century, GLOBE 2002 offers the strategic intelligence needed to conquer the challenge of balancing business, energy and environment agendas. Strategically positioned to take place prior to the Earth Summit in Johannesburg, GLOBE 2002 is a

platform for government and business to come together and interact on the key business and environment issues that comprise the agenda of the 21st Century. In addition, GLOBE 2002 will take a detailed look at the energy-environment linkages that will define the emerging continental energy strategy in North America. For more information and registration visit [WWW.GLOBE2002.COM](http://WWW.GLOBE2002.COM).

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## The CSEM Newsletter

DO YOU HAVE A SHORT ARTICLE OR ANNOUNCEMENT YOU WISH PUBLISHED?

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## Registered Engineers for Disaster Relief



What is RedR? RedR relieves suffering in disasters by selecting, training and providing competent and efficient personnel to humanitarian aid agencies world-wide. RedR members provide front-line relief agencies with technical assistance vital to restoring the everyday lives of affected communities, such as: rebuilding roads and bridges; re-establishing fresh water supplies; managing waste; restoring communications; protecting the environment; and managing financial, material and human resources.

### REDR'S MANDATE:

- Development and management of a world-wide register of qualified disaster relief personnel.
- Development and delivery of formal training courses on disaster relief.
- Production of practical guides, articles and books on disaster relief.
- Building of ties with relief agencies around the world to expedite relief support.

RedR Canada is part of an international organization that relieves suffering in disasters by selecting, training and providing competent and efficient personnel to humanitarian aid agencies world-wide.

Through RedR Canada, you can make a difference to people in need. Lend your skills, your time or your donation to work that truly matters and has a real impact on people's lives.

"I've brought back a belief that I can solve problems... think in a more lateral way... and I have strengthened my commitment to my profession." - RedR Register member

If you are interested in becoming a member of or supporting RedR please go to [WWW.REDR.CA](http://WWW.REDR.CA).

**ENGINEERS WITHOUT BORDERS PROVIDES PEOPLE WITH TECHNICAL SKILLS THE OPPORTUNITY TO HELP THE DEVELOPING WORLD.**

*Reprinted with permission form EWB.*

## Digital lighting in Nepal

*by Meagan Wheeler*

There is a large disparity between the standard of living of people in Canada and people in the developing world. There are ways, however, to lessen the gap between these groups. One of the ways this can be done is through sharing technology. This requires an understanding of the specific problems that need to be addressed. The solution must be carefully crafted so that it is economical for the people using it and durable enough to withstand rough treatment. It must also be simple enough to maintain locally, and the components necessary to implement the solution must be readily available where it will be used. One shining example of a well thought solution comes from the Light Up The World project, which has been working to bring light to the people of rural Nepal. Four years ago Dr. David Irvine-Halliday, an engineering professor from the University of Calgary, was trekking through rural Nepal and observed that a lack of proper lighting in schools was detracting from children's ability to learn. Children had to work all day to sustain themselves and their families, and the absence of a durable, low-energy light source and the lack of available energy sources in the remote villages prevented learning from occurring at night. The system needed to fulfill the demand for light would have to be obtained at minimal cost, due to the poverty of the villages in question. In addition, it would have to be reliable, and simple enough to be maintained. After a year and a half of work, Dr. I-H had still not found a solution to fit the given criteria. That changed when a Japanese company, Nichia, started producing WLEDs (white light emitting diodes). Upon seeing the lighting capacity of one WLED, Dr. I-H convinced Nichia to donate a few thousand of the lights and the Nepal Light Project was born. Dr. I-H started experimenting with different numbers of WLEDs in various arrangements and found that an array of only 6 WLEDs would produce enough light for an entire

room, while requiring only 0.4W of power! With such a small demand for energy per light source, an entire village could be supplied with light on a mere 100W of power. For the initial project, a battery system with a pedal generator was found to be the best power source due to its low expense (Dr. I-H was still privately funding the project at this point), durability and portability. Another important advantage of the system was that it could be built from locally available parts, and therefore easily and economically repaired. In the summer of 1999, Dr. I-H returned to Nepal with his pedal generator and WLED light arrays to test the system and obtain feedback from the Nepalese people on the effectiveness of the system. He also brought along some WLED flashlights that operated 7 times longer on the same number of batteries as the typical incandescent versions. The response was overwhelmingly positive. The villagers were impressed with the system and felt it was a great improvement over previous lighting sources such as candles, kerosene lamps and resin-soaked twigs, which were all fire hazards and released noxious fumes.

During the 1999/2000 school year, Dr. I-H gathered a group of electrical and mechanical engineering students together to start work on a Pico (very small) Wind Turbine that would produce approximately 100W. In the summer of 2000 the team returned to Nepal and wired an entire village with electrical outlets and gave each residence two, 9 WLED array lights. The turbine design supplied twice the power needed to light the houses (1.5W each) and so, provided an excellent opportunity for future expansion.



To maintain the progress that had already been achieved by the project, Dr. I-H and two Nepalese contemporaries established the Pico Power Nepal Company to implement more projects like the wind turbine. The first of these was a request from two friends of Dr. I-H who wished to light a village of 45 homes in the south of Nepal. The selected power source was a solar array, which was designed and installed for \$6500 by the middle of October 2000. Currently, Dr. I-H has another team of students at the University of Calgary working on a Pico Hydro system that will cost less than \$200. Since there is a lot of height for the team to work with, the system will be a low flow, high head system. The team is looking at the possibility of using a commercial turbine that is available in Nepal, hence increasing the usefulness of the system. The Light Up The World project has brought light to more than 1000 people in Nepal and has allowed children who work all day a chance to be educated at night. The group hopes to continue its mission to bring lighting solutions to the developing world through engineering ingenuity and communication between the first and third world. Additionally, plans are in the works for a partnership between LUTW and EWB-ISE Facts about lighting in the

*Continued on page 6*



## **INTUITION: CORE COMPETENCY FOR A NEW MILLENNIUM**

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Next time you're out driving take a look around, at the businesses, the shops, the homes, transport, signs, and people, and wonder "How else could this have looked?"

If we peer into the road ahead, it becomes pretty clear we'll be driving our businesses and lives without precedent much of the time. We'll rely less on past history to prepare a view for the future. The kind of thinking that drives the next century will be radically different than the last one. Those who thrive will be masters of the unprecedented. Competency in intuition and vision will be required personal equipment.

### **THE NEW COMMON SENSE**

Intuition is intelligence and knowing that occurs outside the thinking process. It is an effortless insight that arises and makes sense and it's surprise!, non linear, much like the evolving scientific view of time and events. It also links into "common sense" which remains curiously untaught in the intellectual preferences of the current education and training environment.

Common sense is what drove our ancestors to survive the ruggedness and weather conditions of establishing what North America is today. Yet this was a visceral common sense, relating more to physical survival in a hostile changing environment. The current environment is much more a mental one, multiple priorities and urgencies competing for our "attention". However "attention" in its purest sense is what most of us now do poorly. That will change. What the "new

common sense" of intuition will look like will be more aligned with visionary adeptness, clarifying sense out of information garbage, the ability to out-think our intellectual intelligence and out-smart our brain stem. No longer victims of our intellect, through intuition we'll open doors to creative brilliance.

Through intuition we can "unthink" the paradigm of work, work as effort. There are easier ways. The escalating costs of occupational stress from 3 billion to 12 billion/year in just a few years in Canada alone are unbearable. And these are just economic costs, perhaps the easiest to bear because the human costs on lives and on families, are much higher. Frankly these costs are not required to sustain quality of life. We could do much better than this with a change in strategy.

### **WE'RE SMARTER THAN WE THINK**

We can't create our future in the same way as we arrived here. We're creating a generation of knowledge and communication workers and we're still trying to impose on them a "factory" mentality that was designed to produce widgets in an industrial age rather than results in our time. To produce results you need insight and vision and you need to have inspired people. It is the inspired person who will go the extra step, see the higher potential, build a better client relationship. But that's the tricky part. They have to be inspired from the inside. You can't impose this on anyone and no contemporary management theory will build it.

We need to get back to basics. We've been investing in a way that seemingly benefits economic performance. Its probably wrong. Organizations are leaner and meaner and key personnel are more stressed than ever. How many of today's organizations can truly say they are an energized creative force?

Future prosperity models will show there is a direct linkage among human performance, balance, contribution to society and profits. The reason we didn't see it before is because we weren't looking for it. We were all driving the economic machine.

All invention and breakthrough stems first from ideas. Whole ideas are born from whole people. To date we've invested little on cultivating intuition, vision, and conceptual intelligence. But the potential leverage on such investment is an increase in both human and corporate profit.

Back to intuition. It does restore personal power and vision. But the inevitable question arises. What about the downside? Of course there's a downside. Some talented people might leave to explore their own visions. But others will come, because they're attracted to your vision. There's a catch here too. Your corporate vision had better be compelling enough to invite them in.

Personal commitment will be the creator and sustainer of your organization's success in the future. This commitment will come in all different shapes and sizes. The good news is there is room for all kinds. Individuals must be willing and able to state their commitment to an organization without fear of judgement, and the organization must have an intention to find the right fit.

### **HERE ARE QUESTIONS I'M ALWAYS ASKED.**

"You mean you can actually "train" the intuition?" "Yes." "Well why didn't we do this before?" "Because we didn't think it was possible. We were too smart to think about things like that." "Wow, so how do we do it." "That's another story." "Yes. Its going to be a wild ride. But the first decision we better make is whether we're going to hold the reins.

### **© ARUPA TESOLIN 1998**

Arupa Tesolin is the creator of "Intuita MindWare" an intuitive learning program that teaches how to access intuition on demand, "Intuita for business" corporate training program and a new double CD release "The Visionary Mind." She has been a recent guest on "U\*S\*A\*M" on the Business News Network, "Night Side" CJAD Radio in Montreal, "Talk 1515" in Springfield, Missouri and other radio shows. Arupa is a Speaker, Corporate Trainer and Coach in the subject of intuition. To book or order product contact Arupa at (905)271-7272 or visit [www.intuita.com](http://www.intuita.com) on the internet.

**In Spring 2002 CSEM plans to partner with Intuita to deliver a Toronto area workshop on Intuition: Core Competency For A New Millenium**



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