The Canadian Academy of Engineering
L'Académie canadienne du génie

NEWSLETTER / COMMUNIQUÉ

Number 66 Summer / Fall 2010

A newsletter for the information of the Academy, and a record for other engineering academies and organizations

Inside this issue:

President's Message

Michael E. Charles, FCAE, FCIC, PhD, P.Eng.

I regard it as an honour and privilege to have been elected to serve as President of the Canadian Academy of Engineering. I am deeply appreciative of the Fellows of the Academy for giving me this opportunity and will do my best to advance the objectives of our Academy.

I would like to thank Axel Meisen, now our Past President, for his outstanding leadership and I am pleased that he will continue on the Board of Directors. I will not hesitate to seek his advice. Among his major accomplishments as President was the negotiation of the Memorandum of Understanding and Project Charter for the Trottier Energy Futures Project, about which there is more in this newsletter.

I am also grateful to Past Presidents John McLaughlin and John Leggat who represent the Academy on the Board of the Council of Canadian Academies (CCA). Our sister Academies in the CCA are the Royal Society of Canada and the Canadian Academy of Health Sciences. In addition, John Leggat has served on the Board of the international Council of Academies of Engineering and Technological Societies (CAETS). This recognition flowed from Canada hosting the CAETS Convocation in Calgary in 2009 which focused on the management and sustainability of natural resources.

(Continued on page 2)

Trottier Energy Futures Project

PROJET TROTTIER POUR L'AVENIR ÉNERGÉTIQUE
TROTTIER ENERGY FUTURES PROJECT

Engineers, environmentalists and philanthropists have joined forces to develop solutions for Canada's energy future. The Canadian Academy of Engineering, the David Suzuki Foundation and the Trottier Family Foundation have announced a formal partnership to launch the "Trottier Energy Futures Project (TEFP)", named for entrepreneur, engineer and philanthropist Lorne Trottier, whose family foundation is providing major funding for a multi-year project.

The TEFP was launched at the World Energy Congress in Montreal on September 15, 2010. A new position paper was released during the launch *"Setting the Stage for a Sustainable Energy Strategy: Canada's Necessary Opportunity"* which states that Canada must develop an energy strategy if it is to create a sustainable future and take advantage of the growing opportunities in the clean energy sector. Unlike most industrialized countries, Canada does not have an energy plan. At the launch, Dr. Trottier, FCAE said "Energy poses big challenges for Canada in the 21st century in terms of supply, environmental sustainability, climate change and economics, the Canadian Academy of Engineering and the David Suzuki Foundation, two highly respected organizations, bring different but complementary perspectives to the challenge. The Trottier Family Foundation is pleased to support the joint work in form of a multi-million dollar grant."

(Continued on page 19)

President's Message (cont'd)

(Continued from page 1)

Our 2010 Annual Meeting, held in Toronto in early June, was well attended by Fellows and guests. At the Gala Dinner 34 of 48 new Fellows this year were personally welcomed. It was a pleasure for me to read their citations. The Symposium on the theme "Low Emission Electricity Generation, Distribution and Use in Transportation" attracted much interest and covered topics of broad engineering interest. In addition, Sean Conway spoke eloquently of sociological and political issues which need to be addressed in moving major projects forward, issues which the Academy must keep in mind. I am grateful to members of the organizing committee that helped me put the program together and moderated the sessions. More details on the Annual Meeting appear elsewhere in this newsletter.

My personal priorities for the coming year include --

- furthering the Academy's Strategic Plan as approved at the 2009 Annual General Meeting in Calgary (and set out in the Summer/Fall 2009 Newsletter),
- finding ways to engage the fellowship more extensively in the affairs of the Academy, through regional gatherings or working groups addressing specific issues,
- working with Peter Robinson, President of the David Suzuki Foundation and Lorne Trottier, and members of the Management Committee, to steer the Energy Futures Project forward on a productive course,
- seeking additional opportunities to partner and collaborate with engineering and other organizations with compatible goals, so as to broaden our reach and influence,
- and putting the Academy on a stronger financial base.

Input and advice from members of the Academy will always be welcome. One matter of national importance on which I would appreciate comments is the following. It seems to me that Canada's acknowledged lacklustre innovation capacity (defined as taking an idea or discovery through to commercial success) and our relatively low productivity could both be enhanced by a stronger and wider participation by engineers. Surely, the design of equipment, products and processes must be key to the innovation process and improved productivity. Several of our engineering schools have been judged to be among the best in the world. Our consulting engineers win awards for outstanding projects at home and abroad. So we are not short of talent. But something must be missing. Should we assemble a working group or task force to tackle this one? Please contact me at michael.charles@utoronto.ca.

I enthusiastically look forward to working with the members of the new Board of Directors, the Executive Director Michael A. Ball and Office Manager Valérie Broadfoot in the best interests of the Academy.

Michael E. Charles

We've Moved!

The Canadian Academy of Engineering
180 Elgin Street, Suite 1402
Ottawa, Ontario, K2P 2K3, Canada

Telephone: (613) 235-9056
Fax: (613) 235-6861

Website: www.acad-eng-gen.ca

General address: info@acad-eng-gen.ca

President, Michael E. Charles: president@acad-eng-gen.ca

Executive Director, Michael A. Ball: maball@acad-eng-gen.ca

Office Manager, Valérie Broadfoot: vbroadfoot@acad-eng-gen.ca

Please update your files with our new suite number

CAE Special Events

2010 GALA DINNER, INDUCTION OF NEW FELLOWS, ANNUAL GENERAL MEETING AND SYMPOSIUM ON "LOW EMISSION ELECTRICITY GENERATION, DISTRIBUTION, AND USE IN TRANSPORTATION"

The 2010 Annual Meeting of the Academy was held in Toronto on June 3rd and 4th. It brought Fellows and guests together for the Gala Dinner on the evening of June 3rd and for the Symposium on June 4th. The Annual General Meeting was held prior to the Symposium on June 4th.

The Gala Dinner took place in Stop 33, The Sutton Place Hotel, a fine location on Bay Street overlooking the City. The highlight of the event was the induction and welcome of the new Fellows. Thirty-four of the forty-eight newly-elected members were able to attend the Induction ceremony.

Front row (seated – left to right): P. Simmons, C. Ventura, J.D. Boyd, T. Utigard, G. Refai-Ahmed, V.K. Sood, J. Jiang, D. Petriu, S. Zhu, A. Plumtree, L. Guan

Back row (left to right): R. Mansour, J. Bornemann, Y. Beauchamp, T.S. Sidhu, P. Sampath, A. Hrymak, A.O. Abd El Halim, S. Argyropoulos, W. Vangool, G. Bhuyan, B. Francis, F. Najm, D.S. Scott, J. Zu, A. Goldenberg, M. Perrier, D. Wilkinson, E.V. Polistuk, S. Zaky, Z. Chen, M. Worswick, T. Closson, F. Frantisak

Fellows not in attendance: A. Boukerche, D. Danyluk, N. Djilali, G. Dumont, S. Green, E. Hall, B. Kenny, J. Martí, Y. Ni, A. Poursartip, P. Silveston, H. Wakabayashi, H. Wood, D. Zingg

Gala Dinner

The MaRS Discovery District was the location of the Annual General Meeting and Symposium. The President's Report to the AGM is reported on page 12 of this Newsletter. Draft Minutes of the AGM Business Meeting will be posted on the Members Section of the CAE website.

The Academy has in recent years focused on energy issues through, for example, its Energy Pathways Project and more recently the work of the Power Grid Task Force. Continuing this theme, the 2010 Symposium focused on "Low Emission Electricity Generation, Distribution, and Use in Transportation", reflecting the view that electricity generated with low emissions, especially in terms of carbon dioxide derived from fossil sources, will increasingly become the preferred form of energy in many sectors, including transportation. Because electricity can be generated in a variety of ways and because its end uses take us into exciting new technologies, the program appealed to engineers from all disciplines as well as other professionals engaged in high level business and public policy decision making and indeed attracted some one hundred participants to the MaRS Collaboration Centre close to the University of Toronto.

Bob Evans, FCAE set the stage with a presentation on "Present Sources of Electricity in Canada", highlighting the differing dependencies on coal, nuclear and hydro across the

(Continued on page 4)

CAE Special Events (cont'd)

(Continued from page 3)

country and the lack of provincial east-west interconnections. Jim Carter, FCAE and Amir Shalaby (Ontario Power Authority) compared the Alberta approach to electricity generation based on coal incorporating the promise of carbon dioxide capture and storage with the Ontario approach of phasing out coal.

Gala Dinner

Doug Reeve, FCAE moderated the session "Electricity Supply and Interconnecting Canada" featuring Sean Conway (Queen's University) and Clem Bowman, FCAE. Sean spoke of the need to engage and satisfy our citizens in discussions around the environmental and social implications of major power projects and the associated development of public policy. Clem spoke as Co-Chair of the Academy's Canada Power Grid Task Force and emphasized the importance of a national power grid and Canada's potential as an energy superpower.

The session on "Electrification of Transport" was moderated by Peter Frise, FCAE with David Pascoe (Magna E-Car Systems) and Salwa Fouda (Bombardier) addressing powering vehicles with hybrid technologies, batteries and fuel cells, and the prospects for the electrification of train travel in Canada.

Bob Evans, FCAE

The Symposium closed with a futuristic and optimistic presentation on "Prospects for Inertial Fusion Energy" by Allan Offenberger (University of Alberta) for providing unlimited electricity in the longer term.

The full program and several of the presentations are on the Academy's website www.acad-eng-gen.ca.

Jim Carter, FCAE

(Continued on page 20)

News from the Council of Canadian Academies (CCA)

In celebrating its fifth year of operation, the Council of Canadian Academies undertook a formal third-party review, conducted by an eminent group of experts as a key requirement of its funding agreement with the Government of Canada. The ensuing report entitled *Review of the Council of Canadian Academies — Report from the External Evaluation Panel 2010* assesses the extent to which the Council is meeting its objective to contribute to shaping evidence-based public policy. The group of experts agreed, *without hesitation*, that the Council has been delivering on the objectives set out in its founding documents and providing value in informing public debate and decision making in Canada. The report and the Council's response can be found on the Council's website at www.scienceadvice.ca.

The Board of Governors of the Council of Canadian Academies is pleased to announce the appointment of Ms. Elizabeth Dowdeswell as second President of the Council, of the Council of Canadian Academies. Ms. Dowdeswell's appointment became effective on April 1, 2010. "I am confident Ms. Dowdeswell's visionary leadership and extensive management experience will serve the Council well at this stage of its development. Her knowledge of the Council and her commitment to public policy make her the ideal candidate, we are thrilled she has agreed to take on this very important role," said Elizabeth Parr-Johnston, Chair of the Board of Governors.

The Council of Canadian Academies is also pleased to announce the launch of its new and improved website. The new website prominently features the Council's assessment reports on topics as varied as business innovation, arctic research, groundwater, and nanotechnology. In May 2010 the Council launched its newsletter *Council News* as an e-newsletter which is available for download on the Council's website.

Opinion Piece We just aren't making products people want

by H. Douglas Barber, FCAE and Jeffrey Crelinsten

Canada's prosperity relative to other nations has been declining for over 30 years. Our enormous land mass -- second largest in the world -- has made it easy for us to excel in a resource economy. In a knowledge economy, Canada is a small country; but even to keep up, we must excel here, too.

Except for the U.S., all the countries above us in the rankings of prosperous nations have populations of less than 17 million. Most have very limited natural resources. Our declining position is not due to economy of scale. It is due to ineffective knowledge-based innovation and productivity. The big question is, what is the cause of our lack of effective innovation?

Many people equate innovation with research and development (R&D). Their simplistic notion is that new ideas from research lead to new products and services. This belief is erroneous. Innovation occurs by identifying needs and finding a way to meet them. The resulting value exchange of products and services for money is commerce. We Canadians don't seem to get this. In a recent study of 18 firms that no longer exist we found almost half never had any sales or customers. They were preoccupied for about seven years, on average, with technology and finding money to finance their R&D. Seeking customers and sales was an unnecessary distraction.

We are a country sold on the concept that education and research drive innovation. Creating and receiving value is not a consideration. Our governments act on that belief by investing more of our GDP on education and on publicly funded research than most other developed countries. Arguably our people are among the most knowledgeable and the most capable of discovering new knowledge. However, when it comes to creating value based on knowledge and succeeding in commerce arising from that value exchange, we are among the poorest of developed nations.

It is common at this point to blame Canadian industry, which invests about half of the competitive level in R&D. Canada's R&D-intensive industries do not fare well in global commerce. Those that do often get sold to other companies (mostly foreign) before they reach the $1-billion level of sales. Pointing the finger doesn't address the problem and tends to stifle wider thinking about remediation. Resistance is natural because broader reflection could implicate us all and threaten the comfortable status quo.

Who runs Canada's knowledge-based firms? Almost all of the leaders graduate from university, where the most cherished value is reserved for curiosity-driven research. Their role models are internationally renowned professors whose reputations rest on published research. No wonder the CEOs we interviewed focused on raising finances to do research and neglected the need to create value for customers. Many of these firms died with no direct focus on customers or sales, working on an imagined and untested "intuition" of market need.

They were all strong in science, technology and finance but largely incompetent in and ignorant about commercial enterprise.

(Continued on page 17)

Engineering Institute of Canada Honours, Awards and Fellowships

Six senior medals recipients were presented at the 2010 Awards Gala in recognition of outstanding achievement or service to the engineering profession. The senior awards of EIC are the highest distinctions made by the Institute and are awarded to members of its technical societies. In addition, 20 engineers were inducted as Fellows of EIC for their exceptional contributions to engineering in Canada.

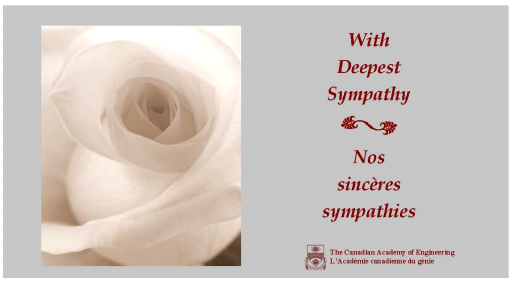
EIC President Marc Rosen presented the recipients at the Institute's Annual Awards Banquet at the Westin Hotel in Ottawa on Saturday, February 27, 2010, an event that helped mark Canada's Engineering Week.

Several CAE Fellows were among the honourees:

- Chul Park - Julian C. Smith Medal (awarded for "Achievement in the Development of Canada")
- Levente L. Diosady - K.Y. Lo Medal (awarded for significant engineering contributions at the international level)
- Abdulmotaleb El Saddick - Fellow
- Andrew Goldenberg - Fellow
- Digvir Jayas - Fellow
- Javad Mostaghimi - Fellow
- Douglas Ruth - Fellow
- Larry Seeley - Fellow

Deceased Fellows

The Canadian Academy of Engineering offers its condolences on the death of the Fellows listed below. If you are aware of the passing of a Fellow not listed, please contact Valérie Broadfoot at vbroadfoot@acad-eng-gen.ca.



Jack I. Clark, elected in 1992, deceased September 4, 2010.
Carl B. Crawford, elected in 1994, deceased August 28, 2010.
D. Andrew Eisenhauer, elected in 1992, deceased October 28, 2010.
Nicolas D. Georganas, elected in 1997, deceased July 22, 2010.
Lesmere F. Kirkpatrick, elected in 1987, deceased January 27, 2010.
Reginald E. Tweeddale, elected in 1989, deceased June 27, 2009.

In Memoriam

Jack I. Clark passed away peacefully with his family, photos and many well-wishes by his side on September 4, 2010. Jack - who touched many with his wit, extraordinary intelligence, courage, strength and famous hospitality - will be missed by those who knew him. Jack earned the respect and love of his peers, from his days at Acadia, playing basketball, track and field and embarking on the start of his life as engineer and a life-long lover of ideas. In his career with RM Hardy & Associates, Golder Associates and his beloved C-CORE, Jack led by example, and time and time again, showed himself to be a leader in his field. This culminated in the award of 4 honorary doctorates, the Leggett Award, and the Order of Canada.

Carl B. Crawford died peacefully in Vancouver on Aug. 28, 2010 at age 86, surrounded by his wife of 62 years and his four children. Born in Dauphin, MB, on Oct. 2, 1923, Carl served as a navigator/observer in the RCAF in WWII. He graduated from Queen's University with a degree in Civil Engineering in 1949, followed by post-graduate degrees from Northwestern University and Imperial College of London, England, and an Honorary Doctorate of Laws from Concordia University. Carl had an illustrious career as a geotechnical engineer and was renowned for his pioneering work on leda clay and foundation settlement. During his long career at the National Research Council in Ottawa, Carl published many technical papers, travelled extensively around the world and retired in 1985 as Director of the Division of Building Research. After retirement, Carl continued to contribute to his profession, conducting research at the University of British Columbia, C-CORE in St. John's, NL, and Cambridge University in the U.K.

D. Andrew Eisenhauer died peacefully on October 28, 2010 while surrounded by his family, as a result of a fall while curling. Born in Lunenburg, NS in 1923 Andrew attended school at Lunenburg Academy and later Kings Collegiate School in Windsor, NS and graduated from the Nova Scotia Technical College. Following a period with the Grenfell Mission on their coastal freighter he began his professional career in London, Ontario. In 1947 he co-founded the Atlantic Bridge Company of Lunenburg, which is now the ABCO Group of Companies. He lent his engineering and leadership skills to numerous provincial and national organizations such as the boards of the Maritime Life Assurance, Maritime Tel and Tel, and Chair of the Technical University of Nova Scotia. He particularly enjoyed his association with the National Research Council and the Dalhousie University Business School. He was honoured by his induction into the Junior Achievement Nova Scotia Business Hall of Fame and has been recognized as a Life Member of the Association of Professional Engineers of Nova Scotia; and was a Fellow of the Canadian Society of Mechanical Engineering, the Engineering Institute of Canada and the Canadian Academy of Engineering.

Nicolas D. Georganas passed away in Riyadh, Saudi Arabia, on July 22, 2010. Nicolas was a distinguished professor at the School of Information Technology and Engineering (SITE) and founding Dean of the University of Ottawa Faculty of Engineering. Indeed, throughout his outstanding career, Prof. Georganas won tremendous acclaim: He received two Honorary Doctorates from the Technical University Darmstadt, Germany and the National Technical University of Athens, Greece. He was made an Officer of the Order of Canada, received the Order of Ontario, the Queen Elizabeth II Golden Jubilee Medal and the Killam Prize for Engineering, and was appointed Fellow of the Royal Society of Canada, among many other honours. In 2008, he became Secretary of the Academy of Science at the Royal Society of Canada.

Les Kirkpatrick died on January 27, 2010 at the Veterans Memorial Hospital in Halifax after a long life that was marked by integrity, great accomplishment and bravery in the uniform of his country in war and in the service of the people of Nova Scotia. He will be best remembered as a pivotal figure in the history of Nova Scotia's energy industry. Les was educated at Mount Allison University where he received his certificate in engineering. He then went to the Technical University of Nova Scotia (TUNS) and, in 1936, graduated with a Bachelor's degree in mechanical engineering. Les returned to his home of Parrsboro to become Superintendent of its Municipal System from 1938 to 1940. Like so many young men of his generation,

(Continued on page 17)

Fellows in the News

Cristina Amon has won Engineers Canada's Award for the Support of Women in the Engineering Profession. The 13th, and first female, dean at Canada's largest engineering school, the Faculty of Applied Science & Engineering at the University of Toronto, Cristina Amon is one of Canada's most successful and high profile engineers. A pioneer in the development of computational fluid dynamics for formulating and solving thermal design problems subject to multidisciplinary competing constraints, Ms. Amon continues her research in nanoscale thermal transport in semiconductors and in bio-engineered devices. Under her leadership, the faculty has created specialized mentorship programs such as Skule Sisters, which brings together female University of Toronto engineering students with female high school students interested in engineering. These and other efforts are increasing the faculty's female undergraduate enrolment and important engagement among current and future female engineering students.

Norman C. Beaulieu, Professor and iCORE Research Chair in Broadband Wireless Communications at the University of Alberta has been awarded the 2010 Reginald Aubrey Fessenden Silver Medal "for outstanding contributions in wireless communication theory" by IEEE Canada. IEEE Canada is the Canadian region of the IEEE (Institute of Electrical and Electronics Engineers). IEEE is the trusted "voice" for engineering, computing and technology information around the globe. Each year IEEE Canada showcases Canadian engineering achievements by recognizing the individual achievement of its members with various awards. The IEEE Canada awards the R.A. Fessenden silver medal to outstanding Canadian engineers recognized for their important contributions to the field of telecommunications.

Norman C. Beaulieu has also won the 2010 Canadian Award in Telecommunications Research (CATR) that recognizes outstanding Canadian researchers as demonstrated by their impact on telecommunications research. Beaulieu won for fundamental contributions to the in-depth understanding, analysis, and design of wireless communications systems. The award is normally made every two years at the Biennial Symposium on Communications held at Queen's University in Kingston, Ontario or at the Canadian Workshop on Information Theory. Dr. Beaulieu was presented with an engraved gold medal at the *25th Biennial Symposium on Communications* in Kingston, Ontario on May 13, 2010. Since the inception of the award in 1990, this is the first time in the award's 20 year history that the award has been given to a recipient west of Ontario.

Tom Brzustowski has been named Chair of the Council of Canadian Academies' Scientific Advisory Committee. Elizabeth Parr-Johnston, Chair of the Board of Governors for the Council of Canadian Academies announced the appointment of Dr. Tom Brzustowski, O.C. as Chair of the Council's Scientific Advisory Committee (SAC). Dr. Brzustowski will serve a three-year term effective June 2010. He has served as Interim Chair of SAC since April 2010 and is replacing Elizabeth Dowdeswell who is the Council's newly appointed President.

Levente Diosady has been awarded the Order of Ontario**.** He is a leader in the field of food process engineering whose technique to combat iodine deficiency and anaemia has benefitted millions around the world. He received his medal at a ceremony at Queen's Park on Jan. 28.

Richard J. Kerekes, Professor Emeritus, University of British Columbia, has received the 2010 TAPPI Gunnar Nicholson Gold Medal Award. It is TAPPI's most prestigious annual award and carries a cash prize valued at over US $60,000. "Dr. Kerekes' contributions to research, technology and education for our industry over a 38-year period are exemplary and make him a deserving recipient for TAPPI's highest honor," said Larry N. Montague, President of TAPPI. "He has made numerous significant contributions to papermaking technology during his career, including founding the Pulp and Paper Centre at the University of British Columbia where he established a research program between UBC and Paprican." The Gunnar Nicholson Gold Medal Award was established in 1985 to replace the TAPPI Gold Medal, which had been awarded from 1928 to 1984. It recognizes an individual who has created a preeminent scientific and engineering achievement that has proven commercial benefit to the world's pulp, paper, board and forest products industries and other industries that TAPPI serves.

(Continued on page 9)

Fellows Appointed to the Order of Canada

Congratulations are due to the following Fellows of the Canadian Academy of Engineering who have recently been appointed to the Order of Canada:

Aftab A. Mufti (Member): "For his contributions to and leadership in the field of civil engineering, notably for researching the use of advanced composite materials and fibre optic sensors in the construction and monitoring of bridges and other infrastructures."

Gilles G. Patry (Member): "For his leadership in the post-secondary education sector and for his contributions as an engineer in the area of water treatment."

Past President's Message

Dr. Axel Meisen, C.M., FCAE, FCIC, FIEI, Ph.D., P.Eng., EurIng

While Canada's and most of the world's economies are still recovering from the global recession and some countries, like Haiti, Chile and China, had to contend recently with devastating earthquakes, global conditions are generally improving. These improvements are in no small measure due to the extraordinary work undertaken by engineers. We can take pleasure in the fact that Canadian engineers, including many Fellows of the Canadian Academy of Engineering, have taken lead roles in major construction and re-constructions projects around the world, made possible by special funding. Once the stimulus and disaster relief projects are complete, I think that it is fitting to take account of the work of engineers and celebrate their contributions. The Canadian Academy of Engineering could take a lead role in this endeavour. I therefore encourage you to share with us any information you have on major projects and accomplishments that involve you, other Fellows of the Academy and other outstanding engineers.

The principal foundation of engineering practice is advanced education and research, provided by academic institutions and, in particular, by the members of the engineering professoriate. The Canadian Academy of Engineering currently has many Fellows holding senior positions in academic institutions. In addition, there are four Fellows serving as presidents of major universities in Canada: Dr. Amit Chakma (University of Western Ontario), Dr. Indira V. Samarasekera (University of Alberta) and Dr. Mamdouh Shoukri (York University) and Dr. Elizabeth M. Cannon (University of Calgary). They, together with many other Fellows, demonstrate the fine leadership capabilities that engineers possess in addition to their technical expertise.

Engineers have always worked on the great challenges of the time and none is greater today than the challenge of energy. It is for this reason that the Academy has undertaken a series of energy studies, culminating in the most recent report by its Power Grid Task Force: *"Electricity: Interconnecting Canada – A Strategic Advantage"*. Elsewhere in this Newsletter, you can find details on this report but I want to take this opportunity to express my appreciation to its authors for their work. While this report focuses on the special issue of electrical energy transmission throughout our vast country and argues for the creation of a modern, nation-wide grid, there are many other aspects of energy and energy systems that remain to be addressed in a holistic way. The Academy has turned its attention to this problem. We are collaborating with CAETS (International Council of Academies of Engineering and Technological Societies) in an international project called: "Evaluation of Strategies to Deploy Low Emissions Technologies for Electric Power Generation in Response to Climate Change" and we hope to initiate a major study on future energy systems for Canada in the near future.

An important step in this direction was the special symposium on *Low Emission Electricity Generation, Distribution and Use in Transportation*, which was held in Toronto on June 4, following the induction of new Fellows and our Annual General Meeting. Further details can be found in this newsletter.

In this message, I have referred several times to energy but I do not want to leave the impression that this is our only focus. We are equally concerned about many other matters, including the protection of the environment, safety, water, natural resources, ICT (information and communication technologies), health and social issues. An example of the latter is the work on *Research Integrity*, which is currently being assessed by an Expert Panel (including Daniel W. Smith, a fellow of our Academy), constituted by the Council of Canadian Academies (CCA). In addition to the Canadian Academy of Engineering, the Council's members are the Canadian Academy of Health Sciences and the Royal Society of Canada. We value the leadership that the CCA is providing in assessing key issues; it complements our own activities, which are largely futures oriented.

Last year, the Canadian Academy of Engineering released its Strategic Plan which is being implemented. Key objectives of the Plan are to create insight, inspiration and influence (I^3). I hope that the examples, which I have cited above, provide you with insights into our current work, inspire you and help to extend the influence of our Academy.

Axel Meisen

Save the Date

The Canadian Academy of Engineering's next AGM, Symposium and Induction of New Fellows will take place at The Sutton Place Hotel in Vancouver on June 2 - 3, 2011. The theme of the Symposium will be "Canada as a Sustainable Energy Superpower: Realizing the Vision". Mark your calendars!

Vancouver — June 2 & 3, 2011

Fellows in the News (cont'd)

(Continued from page 7)

TAPPI is the leading association for the worldwide pulp, paper, packaging, and converting industries and publisher of *Paper360°* and *TAPPI JOURNAL*.

Dr. Kuffel (left) receives award from the Rector of the University of Technology in Poznań, Poland.

Edmund Kuffel, a retired dean of engineering at the University of Manitoba, was awarded the title of Doctor Honoris Causa by the University of Technology in Poznan, Poland. The honorary degree is the highest distinction granted for outstanding contributions in science and culture. Kuffel is a well-known member of the Winnipeg Polish community and is a prominent and recognized world authority in the field of high voltage engineering. For his outstanding contributions to the field of high voltage engineering he has also been awarded the IEEE Centennial Medal and is an IEEE Fellow.

Donald S. Mavinic has won the Manning Innovation Awards' 'Dave Mitchell Award of Distinction' for Crystal Green: A Process to Recover Soluble Phosphorus from Wastewater. Engineer, educator, entrepreneur and world expert in wastewater treatment, Dr. Mavinic is the creative force behind a unique technology to recover pipe-clogging phosphorous compounds from wastewater and recycle them into fertilizer. The innovation turns a costly problem into a valuable product while addressing major environmental concerns of our time.

Axel Meisen was appointed President for an initial two-year term by the Canadian Commission for UNESCO at its 50th Annual General Meeting held in Québec from May 6 – 8, 2010. Dr. Meisen currently holds the inaugural Chair in Foresight at Alberta Innovates: Technology Futures (formerly the Alberta Research Council). He has contributed 38 years of service to post -secondary education in Canada and abroad, rising to the position of President of Memorial University of Newfoundland (1999 – 2007), the largest university in Atlantic Canada. He spent the earlier part of his career at the University of British Columbia where he held the positions of Professor of Chemical Engineering and Dean of the Faculty of Applied Science, which includes Engineering, Nursing and Architecture. Dr. Meisen has played major roles in international projects funded by the Canadian International Development Agency (CIDA) in seven countries, including the development of a new humanities-focused professional university in Peru, the introduction of cooperative education programs into Latin America, and a mutual recognition agreement related to accredited engineering programs involving Canada, USA, Republic of Ireland, Australia, New Zealand, Mexico and Hong Kong.

Norbert R. Morgenstern, Distinguished University Professor (Emeritus) of Civil Engineering, University of Alberta, is the recipient of the 2010 Schuster Medal. The Schuster Medal is a joint award from the Association of Environmental and Engineering Geologists and the Canadian Geotechnical Society that recognizes excellence in geohazards research in North America.

Aftab Mufti has been appointed as the Editor-in-Chief, Journal of Civil Structural Health Monitoring (JCSHM), published by Springer-Verlag of Germany.

Ted Stathopoulos, Professor and Associate Dean at Concordia University **r**eceived the 2009 Jack E. Cermak Medal of the Engineering Mechanics Institute of ASCE for his contributions to wind engineering, particularly his work that has been the key ingredient in the low rise wind provisions of the Canadian Building Code and the ASCE 7 Standard, affecting the design of millions of buildings; the medal was awarded during the ASCE/SEI Structures Congress in Austin, Texas in the spring of 2009.

George J.M. Zarzycki was elected a Fellow of the International Society for Photogrammetry and Remote Sensing (ISPRS) on the occasion of the society's Centenary Celebrations on July 4, 2010 in Vienna, Austria. This class of membership is in recognition of sustained excellent service to ISPRS and its aims. The first group of 12 of the newly approved ISPRS Fellows were elected by the General Assembly.

CAE Board of Directors 2010/2011

2010 Ontario Professional Engineers Awards

From left - CAE President Michael Charles, Andrew A. Goldenberg, Monique Frize, Joseph Paradi, Keith W. Hipel, CAE Executive Director Michael A. Ball at the Awards Gala on Saturday, November 20, 2010.

Award winners included the following CAE Fellows:

Monique Frize: 'The Gold Medal' - The premier award of the profession is the Gold Medal, which is awarded only when there is an outstanding candidate. It is given to an association member who is recognized widely as a distinguished practitioner of the profession and has rendered outstanding public service in other fields on a federal or provincial basis. The recipient should be recognized by the public as a professional engineer and a dedicated public servant, who has made significant sacrifices of time and effort to benefit society.

Andrew Goldenberg & **Joseph Paradi**: 'The Engineering Medal - Entrepreneurship' - The Engineering Medal is given to association members who have contributed substantially to advancing the engineering profession in any of its branches. Recipients' achievements are significantly above the normally high standards of the profession. The Entrepreneurship category is recognition for applying new technologies or innovative approaches that have enabled new companies to get started, and/or assisted established companies to grow in new directions. The engineer should have demonstrated the initiative, energy and spirit it takes to seek out new ideas and to take a leading role in fostering and promoting them.

Keith Hipel: 'The Engineering Medal – Research and Development Category' - The Engineering Medal is given to association members who have contributed substantially to advancing the engineering profession in any of its branches. Recipients' achievements are significantly above the normally high standards of the profession. The Research and Development Category is recognition for using new knowledge in developing useful, novel applications, or advancing engineering knowledge or applied science, or discovering or extending any of the engineering or natural sciences.

CAETS 2010 Annual Meeting

The 31st Annual Meeting of the International Council of Academies of Engineering and Technological Sciences (CAETS) took place in Copenhagen, Denmark June 29-30, 2010. A symposium held June 29 focused on how to achieve a sustainable global food system, which allows increased food production while reducing poverty and hunger and over-exploitation of natural resources. It was noted that past advances in food production, obtained in part by over-exploitation of natural resources, as more land was brought into agriculture and new fish stocks were exploited, must be avoided. Achieving sustainable management of natural resources while meeting increasing future food demands was recognized as the key to success.

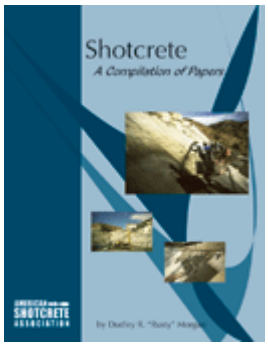
John Leggat, Michael Charles & Michael A. Ball

The conference rejected the notion that efforts to assure food security for all must necessarily be at the expense of the environment. While the continuing need to develop new technologies, particularly in recognition of the vulnerability of food security to global climate change, should not be underestimated, some of the solutions to achieve a sustainable food system are available through regional adaptation and utilization of technologies already developed. Progress toward food security today can be facilitated today by adoption of economically and politically feasible government interventions, for example, to provide access to available technologies to indigent farmers.

The CAE delegation consisted of President Michael Charles, CAETS Past-President John Leggat and Executive Director Michael A. Ball. Visit the CAETS website at www.caets.org for additional information and copies of the presentations and A CAETS Symposium Statement – *Sustainable Food Systems – Toward Food for All* and information on the CAETS Executive Committee meeting, the CAETS Board meeting and the CAETS Council meeting.

The CAETS 19th Convocation with the theme "Engineering Analysis and Management to Reduce Risks" will be held in Mexico City, June 27 – July 1, 2011.

New Publication



The 424-page hardcover book, *Shotcrete: A Compilation of Papers*, is a collection of the most important papers concerning shotcrete by Dudley R. "Rusty" Morgan, FCAE, FACI, PhD, P.Eng.
Topics in the book include:

- **Shotcrete Research and Development** – Morgan supervised many programs to further new shotcrete technology, including investigations of shrinkage and bond of shotcrete.
- **Freeze-Thaw Durability of Shotcrete** - Morgan participated in many of the durability studies conducted on shotcrete in North America.
- **Fiber-Reinforced Shotcrete** - Morgan and his colleagues in Western Canada were pioneers in the development and use of fiber-reinforced shotcrete. His ground-breaking paper with Dallas Mowat comparing plain, mesh, and steel fiber-reinforced shotcrete in 1984 led to the extensive use of fiber-reinforced shotcrete for ground support throughout the world.
- **Shotcrete for Ground and Underground Support** - The five papers included here illustrate the growth and efficiency of this technology.
- **Infrastructure Rehabilitation with Shotcrete** - A medley of presentations demonstrating the various ways shotcrete can be used to restore the structural utility of our infrastructure, and a review of other applications for shotcrete.
- **Supplementary Shotcrete Publications** – How to best take advantage of this most versatile application technology for placing concrete.

Rusty Morgan has over 40 years of experience in materials engineering, specializing in concrete technology, and is recognized as an authority in shotcrete technology throughout the world. The listing of selected examples of projects he has worked on during his career is over 8 pages long, and his bibliography includes more than 140 peer-reviewed papers. He has also served as editor of several books.

If you have published a book recently, and would like to have it noted in the CAE Newsletter, please contact Valérie Broadfoot at vbroadfoot@acad-eng-gen.ca.

Executive Director's Report

As you read this newsletter and specifically President Michael Charles' message and Past-President Axel Meisen's message and his report to the 2010 Annual General Meeting, you will see that many activities have taken place in recent months and many more are planned for 2011. The implementation of the near-term objectives of the CAE Strategic Plan will be a major priority and it is hoped that more Fellows will become engaged in contributing towards achieving these objectives. Many Fellows are actively involved in the planning and organizing of the CAE 2011 Annual Meeting under the leadership of President-Elect Kim Sturgess, forging ahead with the Trottier Energy Futures Project, some Energy Pathways activities, continuing involvement with our Canadian Engineering Leadership Forum partners, and ongoing collaboration with the Council of Canadian Academies (CCA), to new a few.

I would specifically like to mention the warm welcome we have received from CCA President Liz Dowdeswell, Vice-President Tom Bursey, and staff as we moved the CAE Office to Suite 1402, thank you! Appreciation and thanks are also due to Chantal Guay CEO of Engineers Canada and all staff for their help and support during the Academy's stay within Engineers Canada's offices.

We continually strive to improve communications to our Fellows and I encourage you to visit the Academy's website www.acad-eng-gen.ca often. It provides the latest news and information regarding not only CAE Fellows and CAE related activities but also other events, activities and information of interest. Fellows are reminded that to access the **Members Section** of the CAE website your **Username** is your e-mail address that is registered with the Academy. If you have forgotten your **Password**, contact CAE Office Manager Valérie Broadfoot.

I particularly encourage you to visit the websites of our CAETS sister academies which can be found by going to LINKS on the CAE website www.acad-eng-gen.ca/e/link_.cfm. Several of the CAETS member academies have very informative and interesting publications that can be downloaded for free.

Many of you will be aware by now that I have informed the Academy's Board of Directors that I wish to step down from the position of Executive Director of the Academy. I have very much enjoyed my term as Executive Director and I thank the many of you who have helped me in my role, and have contributed wisely in assisting me to enhance the Academy's visibility and

(Continued on page 13)

President's Report to the 2010 Annual General Meeting

It is my pleasure to present the report of the President to the Annual Meeting of the Canadian Academy of Engineering (CAE).

Since our 2009 Annual Meeting, we have pursued the course set out in our Strategic Plan. The Plan foresees a comprehensive set of actions to elevate our Academy beyond an honorific organization and to heighten its value to members, the engineering community and the public at large. Your Board of Directors took the view to focus on major initiatives that reflect the three principal thrusts of our Strategic Plan: Insight, Inspiration and Influence, abbreviated I^3. Consistent with the values of the engineering profession, I^3 is to be pursued with the view to furthering the public good and safety.

Our first major initiative was to host the 18th annual CAETS convocation in Calgary. CAETS (the International Council of Academies of Engineering and Technological Societies) consists of 26 engineering academies and technological societies from around the world. In addition to the usual business meetings, we held a major symposium on *Global Natural Resources – Management and Sustainability*. The symposium was introduced by Peter Lougheed, former premier of the Province of Alberta, who reflected on the long-term consequences of his key decisions in the area of natural resources, including the development of the Alberta oils sands. Natural resources are of world-wide importance and the presentations and deliberations resulted in a major declaration. This declaration, the full text of which can be found on the CAE's website, calls for sustainable stewardship of natural resources, with particular emphasis on energy. CAETS also facilitated the formation of a multi-national project on the Analysis of Strategies to Accelerate the Deployment of Low Emissions Technologies for Electric Power Generation in Response to Climate Change, initiated by the Australian Academy of Technological Sciences and Engineering (ATSE). Professor Robert Evans, FCAE is representing the CAE in this international project.

While the CAETS convocation was largely a gathering of members of the engineering community, it also attracted considerable interest from the media and helped the public and policy makers to gain a better understanding of engineering issues. The CAE recognizes the importance of politicians being well informed about engineering matters. The Academy therefore encouraged and facilitated presentations by Fellows to Federal parliamentarians and senators. I want to recognize particularly the presentations made by Fellows Donald Mavinic (*Wrestling with phosphorus: How new Canadian environmental technology is helping address an urgent global problem*), Robert Evans (*Four Ways to Combat Climate Change)* and Richard Marceau (*The current state and future of Canada's energy sector*). These presentations were extremely well received and helped to inform our legislators on current and emerging engineering issues.

Clem Bowman and Richard Marceau also took key roles in a series of energy studies. The most recent one is *Canada's Energy System: Progress Toward Goals – Our Report Card* and *Electricity: Interconnecting Canada – A Strategic Advantage*, which were the cornerstones of a workshop held by the CAE and the University of Western Ontario in Sarnia on May 18, 2010. I was privileged to attend the workshop and to engage in the debate on Canada's role in energy. Prime Minister Harper speaks about Canada being an energy superpower. While it is clear that Canada has natural resources that are outstanding in quantity and quality, our country faces major challenges with respect to accessing, distributing and utilizing these resources. The issue of upgrading our natural resources into high-value energy and other products is another great challenge. The increasing exportation of raw energy products, such as bitumen, is a case in point. Other major issues are our ageing electricity generation and transmission infrastructure and the lack of a comprehensive nation-wide electricity grid. The latter is a major impediment to harnessing renewable energies such as wind and solar energy, which are inherently variable and require transmission over long distances to balance supply and demand.

The future of Canada's energy system is central to our way of life and economic prosperity. The system must be developed and function in such a way that all Canadians are provided with reliable, affordable and sustainable energy. The latter is particularly important because of the growing global concerns about climate change. Given the importance of Canada's future energy system, the Academy worked diligently over the past year to initiate a major future energy study. I am pleased to inform you that at noon today we will unveil the essential aspects of such a study, a study that will be carried out by several partners each one of which has different capabilities. Together, we will be able to provide industry, government and the public with tangible recommendations for creating an optimal energy system for Canada. The study will be comprehensive and inclusive. Particular attention will be paid to taking recommendations to action.

Over the past year, we have strengthened and extended our working relationships with our sister academies and organizations. I want to mention, in particular, our relationship with Engineers Canada, with which we have engaged in the Canadian Engineering Leadership Forum (CELF), and our sister academies in Canada: The Canadian Academy of Health Sciences (CAHS) and the Royal Society of Canada (RSC). The CAE, CAHS and RSC are constituent members of the Council of Canadian Academies (CCA). The CCA has a mandate to conduct assessments on issues of major importance and several of our Fellows have and are currently participating in such assessments. The CCA is ably led by Dr. Elizabeth Dowdeswell, who is making special efforts to support the academies and ensuring that we work effectively together.

(Continued on page 13)

President's Report to the 2010 Annual General Meeting (cont'd)

(Continued from page 12)

Finally, I wish to recognize the unstinting support that the CAE has received from the members of its Board of Directors, the many Fellows who have volunteered their services and, of course, the staff. Given the major projects that we have undertaken, the load on our Executive Director (Michael A. Ball) and our Office Manager (Valérie Broadfoot) has been heavy.

To serve our Academy as President was a singular distinction for me. If I have succeeded, it has been the result of the good, creative counsel provided by many and, of course, the willingness to lend a hand when it really mattered.

I want to thank our Past President, John Leggat, for his leadership and am delighted that he will continue to work for the good of our Academy by serving on the Board of Directors of the Canadian Council of Academies.

As a final point, let me express two wishes.

The first wish is that Fellows of the Academy, individually and collectively, share their experiences and wisdom more widely on a local and national level. We already saw the success of regional meetings at the recent Workshop in Sarnia. More of this can and should be done.

My second wish is that you provide our incoming President, Michael Charles, with the same support and cooperation that you have extended to me. Given his capabilities and your support, I am confident that he will take our Academy to new heights.

Respectfully submitted,

Axel Meisen

Executive Director's Report (cont'd)

(Continued from page 11)

influence. Nevertheless, time stands still for no one and as I go forward I owe much more time to my family. I have given my undertaking to the Board that I will continue as Executive Director until a suitable replacement has been found. A search announcement for a new Executive Director has been circulated to CAE Fellows and others, and is included with this newsletter.

My sincere thanks go to CAE Office Manager Valérie Broadfoot, who handles the office administration and day to day enquiries in a super-efficient fashion.

Our goal is to enhance the visibility of the Academy and also improve services to members. We welcome your comments and suggestions; please contact us with your ideas!

I wish you all, season's greetings, best wishes for the holidays and a happy, healthy and prosperous New Year.

Michael A. Ball

CAE Fellows elected Fellows of the Royal Society of Canada

The Royal Society of Canada has elected 75 new Fellows, two Specially Elected Fellows, three Foreign Fellows. The newly elected Fellows have diverse backgrounds and disciplines but they have been elected to the Society by their peers in recognition of outstanding scholarly, scientific and artistic achievement. This year's new Fellows were inducted to the RSC during the Induction and Awards Ceremony on Saturday, November 27, 2010 at the National Gallery of Canada in Ottawa. Please visit the Society's website at www.rsc-src.ca for the complete list of newly elected Fellows and their nomination citations.

CAE Fellows included Yusuf Altintas, Savvas Chamberlain, Fadhel Ghannouchi, Tho Le-Ngoc and Anastasios Venetsanopoulos.

Reminder to CAE Fellows

Fellows are reminded to inform Valérie Broadfoot of any change of address or status.

Please send your new contact information to vbroadfoot@acad-eng-gen.ca.

PAGSE Annual Activity Report 2010

The Partnership Group for Science and Engineering (PAGSE; www.pagse.org) is a cooperative association of more than 20 national organizations in Science and Engineering. It was formed in June 1995 at the invitation of the Academy of Science of the Royal Society of Canada. The national organizations that comprise PAGSE represent approximately 50,000 individual members from industry, academia, and government sectors. They work collectively to represent the Canadian science and engineering community to the Government of Canada, and to advance research and innovation for the benefit of Canadians. PAGSE is *not* a lobby group. It does not seek an audience in order to advance the cause of specific science and engineering initiatives: rather, its intent is to address the broader issues of science and engineering policy at the national level.

To be truly representative of the science and engineering community in Canada, PAGSE must ensure that individual members of member societies and associations are aware of the activities that are undertaken in their name. While details may be found on the PAGSE website (www.pagse.org), PAGSE also provides a periodic summary of activities.

PAGSE Representatives

A full list of PAGSE representatives can be found at www.pagse.org/en/links.htm.

PAGSE Membership

PAGSE membership continues to grow. A new member society is: *Canadian Physiological Society*

Bacon & Eggheads

PAGSE, in partnership with the Natural Sciences and Engineering Research Canada (NSERC), sponsors a monthly breakfast meeting held on Parliament Hill, and known as *"Bacon and Eggheads"*. Speakers at the meetings inform parliamentarians about recent advances in science and engineering. In 2010 PAGSE has organized the following presentations:

The Science of Bacon and Eggs
Marc-André Sirard, Université Laval — Thursday March 25, 2010

The ABC's of Quantum Magic
Gilles Brassard, Université de Montréal — Thursday April 22, 2010

Water prescriptions for a dry land - how the West can prepare for drought
John Pomeroy, University of Saskatchewan — Thursday May 27, 2010

Turbo Science-Supercharging Discovery and Innovation
Eugenia Kumacheva, University of Toronto — Thursday September 30, 2010

Understanding Biodiversity: the next Big Science Project and how it will change politics
Graham Bell, McGill University — Thursday October 28, 2010

Fisheries and global warming, and their impact on marine ecosystems and global food security
Daniel Pauly, University of British Columbia Fisheries Centre — Thursday November 25, 2010

PAGSE Monthly Meetings

Guests, representing science and engineering in the government and industry sectors, are invited to monthly PAGSE meetings to present their perspectives on science and engineering in Canada, on the activities of their organizations, as well as the potential issues and challenges that they would like to see PAGSE address. Members also consider federal activities and reports and how best to promote and sustain Canada's scientific base. The meetings are held at the University of Ottawa. During the last year PAGSE has welcomed the following guests:

(Continued on page 15)

PAGSE Annual Activity Report 2010 (cont'd)

(Continued from page 14)

January 21, 2010: **Mr. Bud Locklear, Senior Specialist, Energy, Env., S&T, Embassy of the United States**
February 23, 2010: **Mr. Paul Davidson, President, AUCC**
March 25, 2010: **Dr. Om Malik, IEEE President**
April 20, 2010: **Dr. Chad Gaffield**, **President SSHRC**
May 18, 2010: **Dr. Eliot Phillipson**, **President, CFI**
June 10, 2010**: Dr. Suzanne Fortier, President, NSERC**
September 28, 2010: **David Mitchell, President, Public Policy Forum**
October 28, 2010: **Penny Park, Executive Director, Science Media Centre of Canada**
November 25, 2010: **Ms. Denise Amyot, President & CEO, Canada Science and Technology Museums Corporation**

Submissions to Parliamentary Committees

House of Commons Finance Committee
PAGSE submits a brief each year to the House of Commons Standing Committee on Finance (HCFC).

2010 Summary of the Submission:

The Partnership Group recommends that the Government:

- Compete aggressively for global research talent by establishing programs to bring international students to Canada and by providing expanded opportunities for Canadians to study abroad;
- Make data generated from federally funded research freely available online and provide the capacity to ensure data stewardship and preservation in the long term;

Establish a centre for engineering and technology in the North to support innovation and sovereignty in Canada's Arctic regions

For further information on activities, please visit the PAGSE website www.pagse.org

SciencePages is the initiative by the Partnership Group for Science and Engineering (PAGSE) to provide short science and engineering briefing notes on topical issues for Canadian Parliamentarians.

With the support of NSERC and CFI, PAGSE undertook a pilot issue on the topic of biodiversity which was launched on October 28th at the Bacon and Eggheads presentation on the same topic. SciencePages is valuable both because of the product (the note itself) and the process, which brings together interns with backgrounds in science, policy and communications. The note was prepared by the interns, and then reviewed by senior scientists and policy analysts. There has also been thorough attention to layout and branding. PAGSE is extremely pleased with the final product. The pdf version of the first issue can be downloaded from the SciencePages website www.sciencepages.ca or sciencepages.ca

PAGSE's goal is to see SciencePages, supported by both PAGSE and an Advisory Group to help set direction, become a fixture on the Canadian science-policy landscape as a quarterly (at minimum) publication. Getting to that stage will require more support and we will be working towards securing this support in the coming weeks and months.

For the moment, PAGSE is proud to have reached this milestone with SciencePages. PAGSE invites you to provide feedback once you have had a chance to review the first issue. You can contact us at info@sciencepages.ca.

Energy Pathways Task Force News

In recent months members of the CAE Energy Pathways Task Force under the very able leadership of Clem Bowman and Richard Marceau have been actively engaged in promoting the ongoing work of the task force. Some of the activities are listed here:

On May 6, 2010 Richard Marceau and Michael A. Ball appeared before the Standing Senate Committee on Energy, the Environment and Natural Resources and briefed committee members on the work of the Energy Pathways Task Force and more specifically on the Summary and recommendations of the CAE's Power Grid Task Force.

On May 18, 2010, in conjunction with the University of Western Ontario Research Park Sarnia – Lambton Campus, organized the workshop "Canada - A Sustainable Energy Superpower: The Vision and the Progress".

On June 10, 2010 Clem Bowman, Katherine Albion, Richard Marceau and Michael A. Ball met with Parliamentarians in Ottawa to brief them on "What it means to be an energy superpower re Canada's current position", highlighting examples of past Canadian national projects, and examples of major Canadian Technology Projects that would help move Canada toward the Prime Minister's energy superpower vision.

L to R: Pat Davidson, M.P. Sarnia-Lambton; Hon. Gary Goodyear, Minister of State (Science and Technology); Michael A. Ball, FCAE; Hon. Robert Peterson, Senator; Clem Bowman FCAE; Hon. Elaine McCoy, Senator; Murray McLaughlin, Executive Director, BioIndustrial Innovation Centre; Mike Bradley, Mayor of Sarnia.

On October 4, 2010 attended and participated at the Grand Opening of the Bioindustrial Innovation Centre at The Research Centre, Sarnia, Ontario. The Centre is now named the **Bowman Centre for Technology Commercialization** in honour of Clem Bowman.

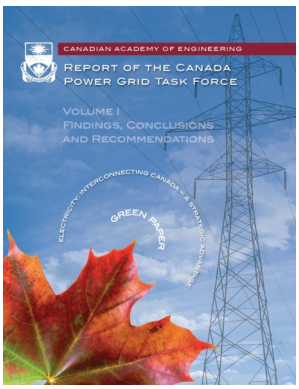
On October 5, 2010, in conjunction with the University of Western Ontario Research Park Sarnia – Lambton Campus, organized a meeting: "Responding to the Senate Energy Challenge"*

- Working for the prosperity of all Canadians
- Taking responsibility for addressing climate change, now

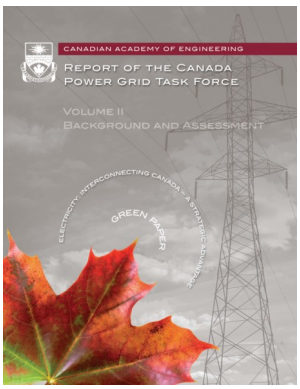
* Towards a Canadian Sustainable Energy Strategy - Seventh report of the Standing Senate Committee on Energy, the Environment and Natural Resources.

Report of the Canada Power Grid Task Force

The findings and conclusions of the Report of the Canada Power Grid Task Force – *"Electricity: Interconnecting Canada – A Strategic Advantage"* provides the basis and focus for an informed debate on the opportunities afforded by "interconnecting Canada". The work was done with the view to ensuring that the nation's electricity needs are met in a sustainable and environmentally sound manner. The report develops the case for expanded electricity connections in order to meet Canada's electricity needs for the next 25 years. This report is the result of the Academy's 2007 *Energy Pathways Task Force Phase 1 – Final Report* which recommended a major upgrade to Canada's electrical infrastructure, including improved access for wind and solar energy sources and enhanced capacity for energy storage.



Volume I and II of the report are available at www.acad-eng-gen.ca for download.



In Memoriam (cont'd)

(Continued from page 6)

Les' life was changed forever by the Second World War. For his bravery during his military service, particularly during the final days of war on the western front, Les received the Distinguished Service Order. After being demobbed from the Army, Les became a construction and design engineer with Canada Electric Co. Ltd. in Amherst. After nine years with that firm, Les became Commercial Superintendent of the Nova Scotia Power Commission and, then, in 1972, he became General Manager of the Nova Scotia Power Commission, the province's publicly owned power utility. After the emotional takeover of Nova Scotia Light and Power, Les, in 1973, assumed the mantle of President and General Manager of the newly formed Nova Scotia Power Corporation (NSPC). In 1978, Les became President and Chairman of NSPC before, in 1980, being appointed President and Chief Executive Officer, and simultaneously made a Director of NSPC. He was awarded an honorary doctorate in engineering by TUNS in 1973 and then went on to serve as a member of the University's Board of Governors from 1985 to 1996. In 1972, his colleagues in the engineering profession awarded Les the F. H. Sexton Medal. He was a founding member and director of the Canadian Academy of Engineering and, for many years, was a member of the Board of the Canadian Electrical Association. In 1993, Les became an honorary life member of the Association of Professional Engineers of Nova Scotia.

Reg Tweeddale passed away on June 27th, 2009 at the Dr. Everett Chalmers Hospital in Fredericton, New Brunswick. Reg was a long time supporter of the University of New Brunswick from the time he received an Electrical Engineering Degree in 1935 and an honorary Dr of Science in 1973. He served on the board of Governors starting in 1961 until his death. He was named Chairman of the Board for two terms starting in 1980. While a member of the UNB Alumni Association he was chairman on the review of the role of the Association in the UNB family, which resulted in a revision of the Act. During World War II, Reg joined the RCAF and was later transferred to the RAF to work with the then new Radar System. He served in England and the Middle East from 1941 to 1945. After the war he returned to NB to resume his career. He served NB Power for twenty-three years and was the first general manager of the New Brunswick Electric Power Commission. He received the award of "Electrical Man of the Year" in 1961. In 1962 he was the first NB engineer to be appointed President of the Canadian Electric association. He was the recipient of C.C. Kirby Award in recognition of outstanding service to the profession and the province. Reg also served as the province's first deputy minister of Economic Growth and as director of the New Brunswick Forest Resources Study. He later became a gentleman farmer in Prince William. He was appointed to the Order of Canada in 1978 and will be greatly missed by family and friends.

We just aren't making products people want (cont'd)

(Continued from page 5)

This commerce naiveté is the major cause of endemic commercial failure in Canada. Doing more of what we have been doing will not correct this. Indeed, continuing the commercialization demands on academic research may actually do more harm than good. Investing more in failing enterprises will not correct it either.

The solution will not be the commercialization of publicly funded post-secondary research. Less than one per cent of the world's new knowledge is generated by Canada's publicly funded research.

Sustainable knowledge-based enterprises must be creating value based on the world's knowledge. The key will be enabling our young, highly educated and research-experienced people to identify appropriate global customer needs that they can meet better than anyone else. Such human, customer focus is sadly lacking in Canada's highly educated people. They (and that's most of us) don't even know that it is essential for success.

Both provincial and federal governments, who fund the learning environment, focus on financial (business) and technological (science and engineering) research. Didactic learning is the norm in these arenas. There is no balanced opportunity or requirement to learn the subjective, experience-based human skills required for success.

Correcting this will require some radical change in what governments fund and value in the learning environments they support. It will also require universities to start teaching the fundamentals of successful global value exchange -- namely international commerce.

These changes will be enormously difficult. We must shed false beliefs and perceptions. Nonetheless, it's time to change.

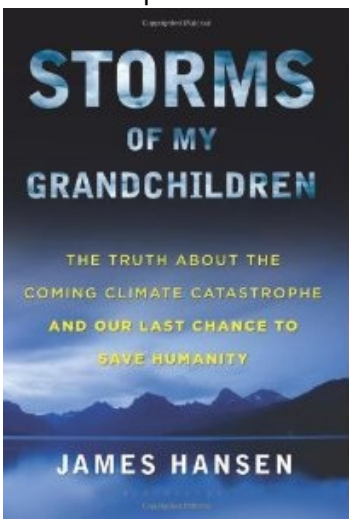
H. Douglas Barber is distinguished professor-in-residence at McMaster University and former CEO and co-founder of Gennum Corporation. Jeffrey Crelinsten is president of The Impact Group, a consulting firm based in Toronto. Their paper, "Understanding the Disappearance of Canadian R&D-intensive firms" is available at www.impactg.com/pdf/disappearanceofstartupsandearlystagefirms.pdf

Reprinted with the permission of the Ottawa Citizen

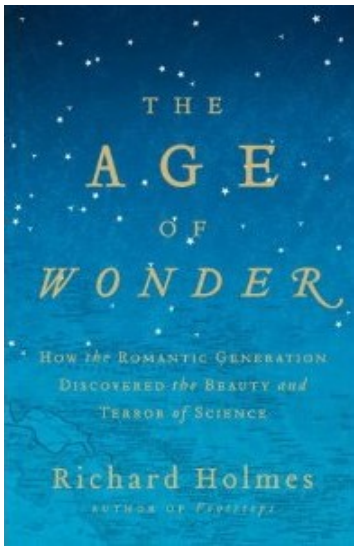
Have You Read?

Note that the following titles are listed for the interest of members; they are not endorsed in any other way by the CAE.

Henry Petroski, author of *The Pencil* and *The Evolution of Useful Things*, has written *The Essential Engineer*: *Why Science Alone Will Not Solve Our Global Problems.* For a quarter-century now, Duke University's Petroski has replaced Samuel Florman as the foremost American civil engineer explaining to lay audiences the nature of engineering and its crucial role in improving the world. Petroski has long been outraged by the persistent elevation of scientists over engineers in terms of intelligence and creativity. Yet none of Petroski's 14 books on technology has argued so aggressively as his newest that engineers do not merely apply what scientists discover. Instead, engineers seek the most appropriate solution out of several to any engineering problem—not the supposedly single solution requiring diligence rather than depth. Analyzing both historical and contemporary examples, from climate change to public health, Petroski shows how science often overlooks structural, economic, environmental and aesthetic dimensions that routinely challenge engineers. Moreover, he says, sometimes science trails technology, as when engineers had to design the first moon landing vehicles before scientists learned its surface composition. Far from being hostile toward science, Petroski pleads for continued cooperation between science and engineering.



Storms of My Grandchildren – The Truth About the Coming Climate Catastrophe and Our Last Chance to Save Humanity, by James Hansen. Dr. Hansen is perhaps best known for bringing global warming to the world's attention in the 1980's, when he first testified before Congress. An adjunct professor in the Department of Earth and Environmental Sciences at Columbia University and at Columbia's Earth Institute, and director of the NASA Goddard Institute for Space Studies, he is frequently called to testify before Congress on climate issues. Dr. Hansen's background in both space and earth sciences allows a broad perspective on the status and prospects of our home planet.



The Age of Wonder: How the Romantic Generation Discovered the Beauty and Terror of Science by Richard Holmes has been inspired by the scientific ferment that swept through Britain at the end of the eighteenth century, 'The Age of Wonder' and which Holmes now radically redefines as 'the revolution of Romantic Science'. The book opens with Joseph Banks, botanist on Captain Cook's first Endeavour voyage, stepping onto a Tahitian beach in 1769, hoping to discover Paradise. Many other voyages of discovery swiftly follow, while Banks, now President of the Royal Society in London, becomes our narrative guide to what truly emerges as an Age of Wonder. Banks introduces us to the two scientific figures that dominate the book: astronomer William Herschel and chemist Humphry Davy. Herschel's tireless dedication to the stars, assisted (and perhaps rivalled) by his comet-finding sister Caroline, changed forever the public conception of the solar system, the Milky Way galaxy and the meaning of the universe itself. Davy first shocked the scientific community with his near-suicidal gas experiments in Bristol, then went on to save thousands of lives with his Safety Lamp and established British chemistry as the leading professional science in Europe. But at the cost, perhaps, of his own heart. Holmes proposes a radical vision of science before Darwin, exploring the earliest ideas of deep time and deep space, the creative rivalry with the French scientific establishment, and the startling impact of discovery on great writers and poets such as Mary Shelley, Coleridge, Byron and Keats. With his trademark sense of the human drama, he shows how great ideas and experiments are born out of lonely passion, how scientific discoveries (and errors) are made, how intense relationships are forged and broken by research, and how religious faith and scientific truth collide. The result is breathtaking in its originality, its story-telling energy, and not least, in its intellectual significance. Richard Holmes is Professor of Biographical Studies at the University of East Anglia. His is a Fellow of the British Academy, has honorary doctorates from UEA and the Tavistock Institute, and was awarded an OBE in 1992.

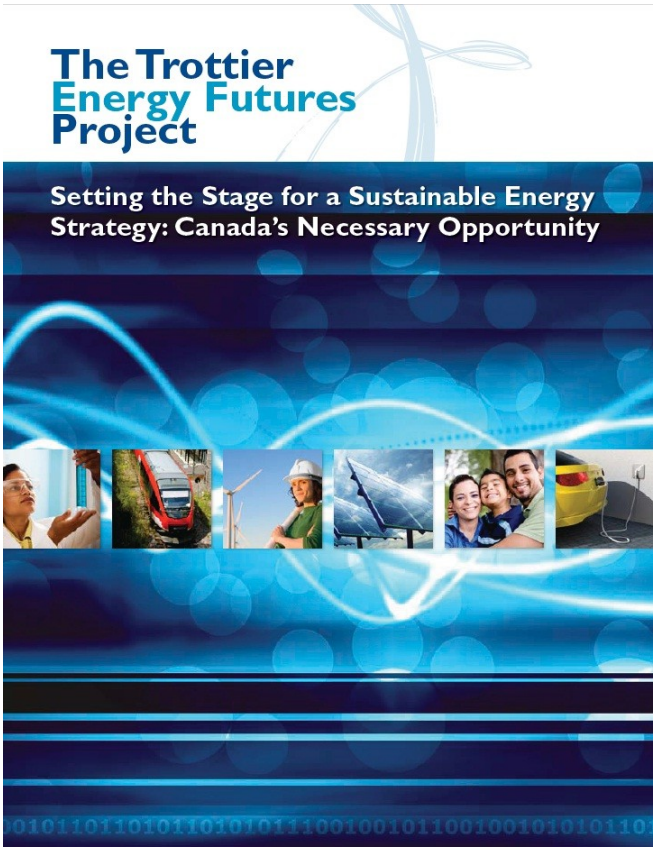
Trottier Energy Futures Project (cont'd)

(Continued from page 1)

The project will start with an evaluation of current and emerging energy technologies and systems relevant to Canada and then proceed to identify integrated solutions for Canada's future energy systems. The partners will also identify the necessary changes in public policy and regulations and seek support for the project and its outcomes from the Canadian public, industry and energy and environment decision-makers.

Dale Marshall (David Suzuki Foundation), Michael Charles (The Canadian Academy of Engineering), Lorne Trottier (Trottier Family Foundation) and Tom Gouldsborough announced on September 15, 2010 in Montreal the launch of the Trottier Energy Futures Project, a unique partnership with the goal of helping to build a clean and sustainable energy future for Canada.

All work will be based on an objective assessment of the best science, engineering expertise and information available. "Much of Canada's current prosperity is linked to its extensive endowment of energy sources," said CAE president Dr. Michael E. Charles. "Going forward, we need to engineer widely accepted solutions that reduce negative environmental impacts of the energy sector while not jeopardizing the social and economic well-being of Canadians." David Suzuki Foundation CEO Peter Robinson said: "We recognized that engaging all sectors of Canadian society will be required to achieve a prosperous clean energy future, we want to arrive at solutions that provide all Canadians with the energy they need for a high quality of life."



The project has four primary goals:

1. To identify energy strategies for Canada to be implemented between now and 2050 that would:
   - Reduce Canada's emissions of greenhouse gases from all aspects of the energy sector with the target of 80 per cent below 1990 levels by 2050;
   - Make Canada a global role model in sustainable generation, distribution and use of energy;
   - Ensure that all Canadians have access to the energy they need to enjoy a high quality of life.

2. To recommend the optimal strategy, from among those identified, for implementation.

3. To persuade the Canadian public, industry and governments that implementing the optimal energy strategy is in Canada's best interest.

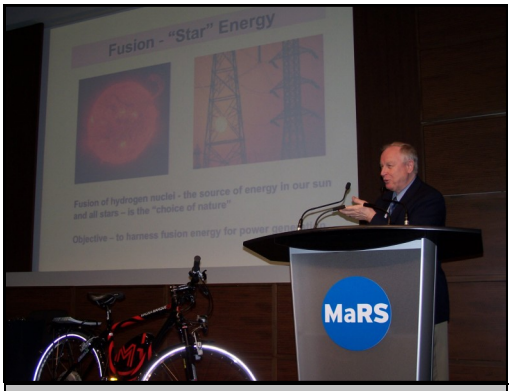
4. To ensure that implementation of the optimal strategy has begun within the terms of this project.

The project outcome will include a series of recommendations, reports, conferences, lectures and meetings that will create a compelling vision and roadmap for a sustainable future of Canada's energy systems. Visit www.trottierenergyfutures.ca for more information on the project and its partners.

(Continued from page 4)

The Academy is grateful to the Symposium Program Committee composed of Michael A. Ball, Robert Evans, Peter Frise, Richard Marceau, Douglas Reeve, Bert Wasmund, and Chair Michael Charles for putting together such an interesting program.

Sean Conway



Allan Offenberger

The Annual General Meeting, and Symposium in particular, would have not been possible without the generous sponsorship, and the Canadian Academy of Engineering wishes to thank and recognize the generous support of our sponsors:

In addition to the corporate and institutional sponsors, the Canadian Academy of Engineering also acknowledges with appreciation the financial support for the Annual General Meeting and Symposium in Toronto, by Pierre Lassonde.

Mark Your Calendars!

The CAE 2011 Induction of New Members, the Annual General Meeting, and Symposium will be held on June 2 & 3 in Vancouver, B.C.

Season's Greetings

Best wishes for the holidays and the coming New Year

The CAE office will close on December 24, 2010 and will reopen on January 4, 2011