

## IPENZ ENGINEERING UPDATE June 2008



### Samplings from this Issue

- The climate for transformation: lessons for leaders.
- Inspiring offices.
- Understanding internally generated risks in projects.
- Sino-Western business negotiations revisited--30 years after China's Open Door Policy.
- A new system for preventing bridge collapses.
- Incorporating climate change in water planning.
- Combined heat and power in commercial buildings: investment and risk analysis.
- Case histories involving stress corrosion cracking of various alloys.

### ► Special Focus on Biofuels

The IPENZ Engineering Update is published by the Energy Library on behalf of IPENZ on a monthly basis.

If you wish to be placed on the mailing list to receive a copy directly, please contact Energy Library. ([library@energylibrary.org.nz](mailto:library@energylibrary.org.nz)) and type "Subscribe IPENZ Update" in the subject line.

If you are interested in any of the publications listed they can be obtained through the Energy Library. Energy Library members can request by quoting the IPENZ code number. Non-members can request by supplying the reference to their organisational or public library.

Articles marked with a "√" are held in the Energy Library collection.

Energy Library requests should be emailed to: [library@energylibrary.org.nz](mailto:library@energylibrary.org.nz)

[Link to previous issues online](#)

If you are interested in Energy Library membership please contact [library@energylibrary.org.nz](mailto:library@energylibrary.org.nz)

## Management/Leadership/Strategic Planning/Recruitment/Training and Development/Project Management/Corporate Responsibility

### √IPENZ 15/01 **How the best of the best get better and better.**

Jones, G. Harvard Business Review, Volume 86 Issue 6 (June 2008) Pages p123-127.

What is the real key to elite performance? According to sports psychologist turned executive coach Graham Jones, star athletes and business people share one defining trait: mental toughness. People who become champions aren't necessarily more gifted than others; they're just masters at managing pressure, meticulously tackling goals, and driving themselves to stay ahead of the competition. Jones, who has advised Olympic medalists and Fortune 500 executives, sees many parallels between the arenas of business and sports, especially in the behavior of people who rise to the very top. These stars have learned to love pressure because it spurs them to achieve. Inner-focused and self-directed, they concentrate on their own excellence and forget the rest. They don't get distracted by others' victories or failures – or even by a personal tragedy off the field of competition. The very best performers also analyze the factors underpinning their success. That helps them build their expertise and their confidence.

### √IPENZ 15/02 **Engineering and technical leadership development : challenges in a rapidly changing global market.**

Vieth, C and Smith, W. Chief Learning Officer, Volume 7 Issue 2 (February 2008) Pages 46-49.

### √IPENZ 15/03 **Developing your leadership pipeline.**

Conger, J and Fulmer, R. Harvard Business Review, Volume 81 Issue 12 (December 2003) Pages p76-84.

Why do so many newly minted leaders fail so spectacularly? Part of the problem is that in many companies, succession planning is little more than creating a list of high potential employees and the slots they might fill. It's a mechanical process that's too narrow and hidebound to uncover and correct skill gaps that can derail promising young executives. And it's completely divorced from organizational efforts to transform managers into leaders. Some companies, however, do succeed in building a steady, reliable pipeline of leadership talent by marrying succession planning with leadership development. Drawing on the experiences of best-practice organizations, the authors outline five rules for establishing a healthy succession management system.

### √IPENZ 15/04 **The dynamics of strategic agility: Nokia's rollercoaster experience.**

Doz, Y and Kosonen, M. California Management Review, Volume 50 Issue 3 (Spring 2008) Pages 95-118.

Case study of strategies at Nokia the mobile communications company.

### √IPENZ 15/05 **Future Center “The Shipyard” : learning from planning, developing, using and refining a creative facility.**

van der Lugt, R. et al. Creativity & Innovation Management, Volume 16 (March 2007) Pages 66-79.

A case study of the design of a creative facility within an organization. The purpose of this facility is to encourage and facilitate strategic thinking and inspire innovation.

- √IPENZ 15/06 **It's more than a desk: working smarter through leveraged office design.**  
Elsbach, Kimberly D and Bechky, B. California Management Review, Volume 49 Issue 2 (Winter 2007) Pages 80-101.  
The modern office often has to provide an increased number of functions in light of current trends such as telecommuting and shared office space. This article outlines a framework for the decisions that need to be made and shows how companies can make the most of the options available.
- √IPENZ 15/07 **Inspiring offices.**  
Schneider, J. Building Design & Construction, Volume 48 Issue 3 (March 2007) Pages 24-30.  
Describes how architects can use office design to impact on creativity in the workplace.
- √IPENZ 15/08 **The concept of workplace performance and its value to managers.**  
Vischer, J. California Management Review, Volume 49 Issue 2 (Winter 2007) Pages 62-79.  
Office design and workplace performance.
- √IPENZ 15/09 **See how they learn.**  
Harris, P. T+D Training and Development, Volume 62 Issue 1 (January 2008) Pages 60-65.  
Describes five creative ideas for workplace training.
- √IPENZ 15/10 **The climate for transformation: lessons for leaders.**  
Isaksen, S. Creativity & Innovation Management, Volume 16 Issue 1 (March 2007) Pages 3-15.  
Advice and case studies for leaders who need to initiate and sustain organisational change.
- √IPENZ 15/11 **Many paths to engagement: how very different management styles get the same great results at Mars, Incorporated.**  
Robison, J. Gallup Management Journal Online (1/10/2008) Pages 1-6.  
Various examples of successful management for high performance within a company structure.
- √IPENZ 15/12 **The twelfth element of great managing: employees don't outgrow the need to learn and grow.**  
Gallup Management Journal Online (4/10/2008) Pages 1-5.
- √IPENZ 15/13 **Project estimate reviews for oil and gas projects.**  
Chuong, Y. AACE International Transactions, (2007) Pages EST 07.1-EST07.3.
- √IPENZ 15/14 **A cost function for the natural gas transmission industry.**  
Engineering Economist, Volume 53 Issue 1 (January 2008) Pages 68-83.
- √IPENZ 15/15 **Risk assessment and allocation in the UAE construction industry.**  
International Journal of Project Management, Volume 26 Issue 4 (2008) Pages 431-438.

This study identifies and assesses the significant risks in the UAE construction industry and addresses their proper allocation. Data were collected through a questionnaire distributed to construction experts. The study reveals that economic risks such as inflation and sudden changes in prices, shortage in material and labour supply are significant. Other significant risks include owner risks such as unrealistic construction schedule, improper intervention and changes in design. Political, social and cultural risks are found to be insignificant. Local and international experts are in agreement as to the ranking of construction risks in the UAE. More risks are allocated to contractors or shared between contractors and owners with only two risks allocated directly to the owners

√IPENZ 15/16 **Tools for developing mutual understanding on classification of construction costs.**  
Kraus, W. AACE International Transactions (2007) Pages ES18.1-ES18.10.

√IPENZ 15/17 **The perceived value and potential contribution of project management practices to project success.**  
Besner, C and Hobbs, B. Project Management Journal, Volume 37 Issue 3 (August 2006) Pages 37-48.  
Research based on a survey of 753 project managers to identify most valued and successful practices.

√IPENZ 15/18 **Understanding internally generated risks in projects.**  
International Journal of Project Management, Volume 23 Issue 8 (2005) Pages 584-590.  
This paper identifies a class of risk that is common, important and yet poorly managed in projects. Internally generated risks arise within a project management team or its host organisation, from their management systems, culture and decisions. Even when a project applies recognised risk management processes, and seems to be managing its risks well, research demonstrates that internally generated risks are a different matter altogether. This calls into question how such risks can be managed, and whether current risk management practices need to be changed.

√IPENZ ENZ 15/19 **Sino-western business negotiations revisited—30 years after China's Open Door Policy.**  
Tung, R., Worm, V and Fang, T. Organizational Dynamics, Volume 37 Issue 1 (January 2008) Pages 60-74.

√IPENZ 15/20 **Collaborative research: developing mutually beneficial relationships between researchers and organizations.**  
Hinkin, T., Holtom, B. and Klag, M. Organizational Dynamics, Volume 36 Issue 1 (2007) Pages 105-118.

√IPENZ 15/21 **Running just to stand still? Managing CSR reputation in an era of ratcheting expectations.**  
Bertels, S and Peloza, J. Corporate Reputation Review, Volume 11 Issue 1 (Spring 2008) Pages 56-72.  
Corporate social responsibility is reviewed.

**√IPENZ 15/22 Prevention, control, sustainability.**

Fearing, J. Industrial Engineer, Volume 40 Issue 5 (May 2008) Pages 38-43.  
How to plan and conduct effective safety audits.

**√IPENZ 15/23 Haz-map: a useful tool for sh&e professionals.**

Brown, J. Professional Safety, Volume 53 Issue 3 (March 2008) Pages 24-28.  
Describes a database which aid decision support in health and safety.

**√IPENZ 15/24 A prioritization process.**

Botta, R and Bahill, T. Engineering Management Journal, Volume 19 Issue 4 (2007) Pages 20-27.  
Describes a process developed by BAE Systems which is used to weigh up various criteria to help prioritize goals, customer needs and other engineering activities.

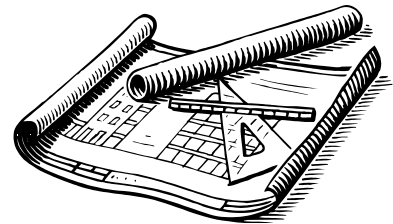
**√IPENZ 15/25 Linking experience and learning: application to multi-project building.**

Mai Anh Thi Le and Carl Brønn. Engineering, Construction and Architectural Management, Volume 14 Issue 2 (2007) Pages 150-163.  
Discusses how to transfer learning across large construction projects in the building sector.

**√IPENZ 15/26 Organizational intelligence surveys.**

Falletta, Salvatore V. T+D, Volume 62 Issue 6 (June 2008) Pages 52-58.  
Discusses the design of company surveys aimed at assessing employee engagement and mind set.

## Technical Aspects of Engineering – Abstracts for most available upon request

**√IPENZ 15/27 A new system for preventing bridge collapses.**

Lee, G and Sternberg, E. Issues in Science and Technology, Volume 24 Issue 3 (2008) Pages 313-36.

**√IPENZ 15/28 Evaluation of seasonal and yearly behavior of an integral abutment bridge.**

Breña, S et al. Journal of Bridge Engineering, Volume 12 Issue 3 (May-June 2007) Pages 296-305.

**√IPENZ 15/29 Post-earthquake assessment of bridge columns.**

Veletzos, M et al. Concrete International, (March 2008) Pages 61-66.

- √ IPENZ 15/30 **A comparison of two regional seismic damage estimation methodologies.**  
Onur, Tuna, Ventura, Carlos E, Finn, Liam W D. Canadian Journal of Civil Engineering. Volume 33 Issue 11 (November 2006) Pages 1401-1410.
- √ IPENZ 15/31 **Quantification of effects of fly ash type on concrete early-age cracking.**  
Riding, K et al. ACI Materials Journal, Volume 105 Issue 2 (March - April 2008) Pages 149-156.
- √ IPENZ 15/32 **Strengthening concrete slabs for punching shear with carbon fiber-reinforced polymer laminates.**  
Sissakis, K and Sheikh, S. ACI Structural Journal, Volume 104 Issue 1 (January - February 2007) Pages 49-60.
- √ IPENZ 15/33 **Built for brains: school design denotes human factors.**  
Rydeen, J., Erickson, P and Lange, J. Industrial Engineer: IE, Volume 40 Issue 3 (March 2008) Pages 32-36.  
Design for function and human comfort in US schools.
- √ IPENZ 15/34 **Optimization of HVAC control to improve comfort and energy performance in a school.**  
Energy Engineering, Volume 105 Issue 3 (2008) Pages 6-23.
- √ IPENZ 15/35 **Risk factors of structural degradation of an urban water distribution system.**  
Journal of Infrastructure Systems, Volume 13 Issue 1 (March 2007) Pages 55-64.
- √ IPENZ 15/36 **Climate change: expert opinion on the economics of policy options to address climate change.**  
Stephenson, J. GAO Reports (6/9/2008) Pages 1-76.  
Focuses on the views of 18 experts who responded to the questionnaires presented by the U.S. Government Accountability Office (GAO) regarding economic policy options to address climate change. The experts comment on the actions that the Congress considered to address climate change and the benefits that can be obtained from it. The experts gave their views on the key strengths and limitations of policies or actions of the Congress in order to address climate change
- √ IPENZ 15/37 **Incorporating climate change in water planning.**  
Freas, K et al. American Water Works Association Journal, Volume 100, Issue 6 (June 2008) Pages 92-100.
- √ IPENZ 15/38 **Multifaceted approach mitigates corrosion of a new wastewater system.**  
Larsen, K. Materials Performance, Volume 47 Issue 5 (May 2008) Pages 30-35.

- √ IPENZ 15/39 **Assessing the carbon footprint of water production.**  
Strutt, J et al. American Water Works Association Journal, Volume 100 Issue 6 (June 2008) Pages 80-92.
- √ IPENZ 15/40 **Modelling the formation and fate of odorous substances in collection systems.**  
Vollertsen, J et al. Water Environment Research, Volume 80 (February 2008) Pages 118-127.
- √ IPENZ 15/41 **Water efficiency programs for integrated water management.**  
Chesnutt, T et al. American Water Works Association Journal, Volume 100 Issue 5 (May 2008) Pages 132-143.
- √ IPENZ 15/42 **Performance evaluation of a biotrickling filter degrading mixtures of hydrophobic and hydrophilic compounds.**  
Paca, J et al. Clean Technologies and Environmental Policy, Volume 9 Issue 1 (February 2007) Pages 69-75.
- √ IPENZ 15/43 **An algebraic targeting approach for effective utilization of biomass in combined heat and power systems through process integration.**  
Mohan, T and, El-Halwagi, M. Clean Technologies and Environmental Policy, Volume 9 Issue 1 (February 2007) Pages 13-26.
- √ IPENZ 15/44 **Combined heat and power in commercial buildings: investment and risk analysis.**  
Maribu, K and Fleten, S. The Energy Journal, Volume 29 Issue 2 (2008) Pages 123.
- √ IPENZ 15/45 **Top tips for specifying a combined heat and power system.**  
Hatherill, David. Power Engineering International, Volume 15 Issue 8 (October 2007) Pages 59-62.
- √ IPENZ 15/46 **Corrosion of concrete reinforcement and electrochemical factors in concrete patch repair.**  
Canadian Journal of Civil Engineering, Volume 33 Issue 6 (June 2006) Pages 785-794.
- √ IPENZ 15/47 **Municipal anaerobic digesters for codigestion, energy recovery, and greenhouse gas reductions.**  
Zitomer, D et al. Water Environment Research, Volume 80 Issue 3 (March 2008) Pages 229-238.
- √ IPENZ 15/48 **Case histories involving stress corrosion cracking of various alloys.**  
Suess, S J. Corrosion, Volume 64 Issue 5 (May 2008) Pages 401-410.

√ IPENZ 15/49 **Quantifying effectiveness of cathodic protection in water mains: case studies.**  
Rajani, B and Kleiner, Y. Journal of Infrastructure Systems, Volume 13 Issue 1 (March 2007) Pages

√ IPENZ 15/50 **Stress corrosion cracking of a vinyl chloride stripper vessel.**  
Linton, V M, and Laycock, N J. Materials Performance, Volume 47 Issue 6 (June 2008) Pages 74-80.

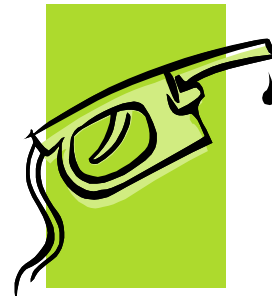
√ IPENZ 15/51 **Current understanding of environment-induced cracking of steam turbine steels.**  
Turnbull, A. Corrosion, Volume 64 Issue 5 (May 2008) Pages 420-439.

√ IPENZ 15/52 **Review of solar cooling technologies..**  
HVAC&R Research, Volume 14 Issue 3 (May 2008) Pages 507-529.

√ IPENZ 15/53 **Robust control and optimisation of energy consumption in daylight–artificial light integrated schemes.**  
Kurian, C et al. Lighting Research and Technology, Volume 10 Issue 1 (March 2008) Pages 7-25.

## Feature Focus Biofuels

Abstracts can be supplied on request



√ IPENZ 15/54 **The Gallagher Review of the Indirect Effects of Biofuel Production (July 2008)**  
East Sussex, Renewable Fuels Agency

Link to resource

<http://www.dft.gov.uk/rfa/reportsandpublications/reviewoftheindirecteffectsofbiofuels.cfm>

IPENZ 15/55 **Do biofuels from microalgae beat biofuels from terrestrial plants?**  
Reijnders, L. Trends in Biotechnology, Volume 26, Issue 7, July 2008, Pages 349-350

√ IPENZ 15/56 **Towards a sustainably certifiable futures contract for biofuels**  
Mathews, J. Energy Policy, Volume 36, Issue 5, May 2008, Pages 1577-1583  
How are biofuels to be certified as produced in a sustainable and responsible fashion? In the global debate over this issue, one party to the proceedings seems rarely to be mentioned—namely the

commodities exchanges through which a global biofuels market is being created. In this contribution, I propose a solution to the problem of sustainability certification through a biofuels futures contract equipped with 'proof of origin' documentation. The proposal does not call for any radical break with current practice, extending existing certification procedures with a requirement for the vendor to provide documentation, probably in barcoded form, of the history of the biofuel offered for sale, including plantation and biorefinery where the biofuel was produced and subsequent blendings it may have undergone. The proposal is thus compatible with the blending practices of large global traders, whose activities are the source of the difficulties of other approaches to certification. It is argued that if such a sustainable futures contract for bioethanol (in the first instance) were to be introduced, then it would likely trade at a premium and become the primary vehicle for North-South trade in biofuels.

√IPENZ 15/57 **The ripple effect: Biofuels, food security, and the environment**

Naylor, R. et al. Environment, Volume 49 no. 9 (November 2007) Pages 30-43.

[Link to resource](#)

[http://iis-db.stanford.edu/pubs/22064/Naylor\\_et\\_al\\_Env.pdf](http://iis-db.stanford.edu/pubs/22064/Naylor_et_al_Env.pdf)

√IPENZ 15/58 **Path dependency and the future of advanced vehicles and biofuels.**

Ahman, M and Nilsson, L. Utilities Policy, Volume 16 Issue 3 (June 2008) Pages 80-89.

The accumulated experience and path-dependent development of petroleum-based transport fuels and internal combustion engine vehicles has created an apparent technological lock-in. Our analysis of a Rapid Future vehicles and Fuels scenario (RAFF) for the EU shows that ambitious carbon emission reductions can be achieved even with projected increases in road transport. Furthermore, escaping the lock-in does not seem insurmountable. For this purpose, three strategic technology platforms should be supported: the electric drivetrain, the biochemical, and the thermo-chemical platforms. Each platform has its own characteristics and exhibits its own path dependencies that are relevant to consider with the aim of accelerating their development and application. Contrary to conventional wisdom indicating that governments should not pick winners, we argue that these three platforms should be subject to focused and concerted development efforts. They all offer advantages to transport as well as other applications, and they match low-carbon futures in which electricity and/or hydrogen are important energy carriers

IPENZ 15/59 **Biofuels sources, biofuel policy, biofuel economy and global biofuel projections**

Demirbas, A. Energy Conversion and Management, Volume 49, Issue 8, August 2008, Pages 2106-2116

√IPENZ 15/60 **Virtual biofuels—A cheaper, better, faster alternative?**

Saunders, H. Energy Policy, Volume 36, Issue 4, April 2008, Pages 1247-1250.

This viewpoint article offers the proposition that purpose-grown biomass buried in landfills constitutes a "virtual" biofuel that is more practical, economic, and immediate than the use of actual biofuels from cellulose. While not a permanent solution, it may be a useful bridge to the hoped-for era of actual biofuels prior to the time technology for economically converting cellulose to actual liquid biofuels is realized.

√ IPENZ 15/61 **Biofuels, neither saviour or scam.**

Hunt, S. World Policy Journal, Volume 25 Issue 1, (Spring 2008) Pages 9-17.

√ IPENZ 15/62 **Betting on biofuels.**

Caesar, W et al. McKinsey Quarterly, Issue 2 (2007) Pages 52-63.

√ IPENZ 15/63 **The rush to ethanol: Not all biofuels are equal** (analysis and recommendations for U.S. biofuels policy) (2007)

Food and Water Watch Network for New Energy Choices in collaboration the Institute for Energy and the Environment at Vermont Law School.

Link to resource

<http://www.newenergychoices.org/uploads/RushToEthanol-rep.pdf>

√ IPENZ 15/64 **Biofuel chain development in Germany: Organisation, opportunities, and challenges**

Energy Policy, Volume 36, Issue 1, (January 2008) Pages 485-489

Increasing production activities have been observed in many EU member states since the EU Commission sent a clear signal establishing and supporting the bioenergy industry. This article discusses current sector developments and therewith evolving biofuel value chain activities and management requirements by means of two German biofuel processing firms. Usually, the processing company can be regarded as the initiator of the regional value chains. In order to safeguard the high initial investments and secure efficient supply, the processing company relies on contract farming or profit participation rights rather than spot market interactions. In addition to discussing that point, this paper also explores opportunities and threats for the suppliers of raw materials as well as for the processors.

**IPENZ 15/65 Biofuel alternatives to ethanol: pumping the microbial well**

Fortman, J. et al. Trends in Biotechnology, Volume 26 Issue 7 (2008) Page 375-381.

Engineered microorganisms are currently used for the production of food products, pharmaceuticals, ethanol fuel and more. Even so, the enormous potential of this technology has yet to be fully exploited. The need for sustainable sources of transportation fuels has generated a tremendous interest in technologies that enable biofuel production. Decades of work have produced a considerable knowledge-base for the physiology and pathway engineering of microbes, making microbial engineering an ideal strategy for producing biofuel. Although ethanol currently dominates the biofuel market, some of its inherent physical properties make it a less than ideal product. To highlight additional options, we review advances in microbial engineering for the production of other potential fuel molecules, using a variety of biosynthetic pathways

√ IPENZ 15/66 **Fuel's gold.**

Black, Joanne. The Listener, Volume 213 Issue 3550 (24-30 May 2008).

A Nelson-based company thinks it has made a breakthrough in the production of biofuels from algae.

√ IPENZ 15/67 **The price of biofuels.**

Rotman, D. Technology Review, Volume 111 Issue 1,(January/February 2008) Pages p42-51.

√ IPENZ 15/68 **Carbon-negative biofuels.**

Mathews, J. Energy Policy, Volume 36 Issue 3 (March 2008) Pages 940-945..

Current Kyoto-based approaches to reducing the earth's greenhouse gas problem involve looking for ways to reduce emissions. But these are palliative at best, and at worst will allow the problem to get out of hand. It is only through sequestration of atmospheric carbon that the problem can be solved. Carbon-negative biofuels represent the first potentially huge assault on the problem, in ways that are already technically feasible and practicable. The key to carbon negativity is to see it not as technically determined but as an issue of strategic choice, whereby farmers and fuel producers can decide how much carbon to return to the soil. Biochar amendment to the soil not only sequesters carbon but also enhances the fertility and vitality of the soil. The time is approaching when biofuels will be carbon negative by definition, and, as such, they will sweep away existing debates over their contribution to the solution of global warming.

√ IPENZ 15/69 **Unilateral trade measures to combat climate change: A biofuels case study.**

Puddle, K.. New Zealand Journal of Environmental Law, Volume 11 (2007) Pages 99-140

√ IPENZ 15/70 **Confronting challenges in developing bioenergy and biofuel.**

Greer, D. Biocycle, Volume 49 issue 2 (February 2008) Pages 45-48.

√ IPENZ 15/71 **Biofuels: The good, the bad and the unusual** – *Renewable Energy World* article by Ralph Sims, International Energy Agency.

[Link to resource](#)

<http://www.renewableenergyworld.com/rea/news/reinsider/story?id=52328>

√ IPENZ 15/72 **Biofuels for transport: Global potential and implications for sustainable energy and agriculture.** (2007) Worldwatch Institute. London: Earthscan This text is intended as a resource for decision makers and presents existing production methods and policies for biofuels and assessing options for their future development.

√ IPENZ 15/73 **Biofuel - fuel of the future.**

Mehra, R. Chemical Business, Volume 21 Issue 9,(September 2007) Pages 37-43.

Biofuels have great potential as an energy source. This paper discusses bio-refineries where biological processes can convert low cost feedstock into energy. The use of potato steam peels for hydrogen fermentation by *Caldicellulosiruptor sacchrolyticus* is introduced.

If you are interested in Bioenergy topics you may be interested in viewing “Bioenergy Update” and “Energy Update”. Visit the news letter section of the Energy Library website to view copies.

<http://www.energylibrary.org.nz/news.asp>