BSE Public CPD Lecture –
The Future of the Building Services Engineering Profession in Hong Kong on 12 November 2010

Organized by the Department of Building Services Engineering (BSE), a CPD lecture on The Future of the Building Services Engineering Profession in Hong Kong was conducted by Prof. Ronald S. Chin on Friday, 12 November 2010. It is of our great pleasure to report that the lecture was successfully held with a full house attendance of 150 participants.

Prof. Chin is an Adjunct Professor of BSE of The Hong Kong Polytechnic University since 2006. He is a Chartered Engineer and a Fellow of the Hong Kong Institution of Engineers of the Electrical, Building Services and Fire Disciplines. He is currently the President of the Hong Kong Association of Energy Engineers and the President of the Association of Energy Engineers, Hong Kong Chapter.

The lecture gave an introduction on the development of the building services engineering profession which took hold in Hong Kong since the mid 1960’s. The profession has now grown to be an
important part of the building industry with thousands of building services engineers involving themselves through designing, installing, operating and maintaining building services systems of our building stock in Hong Kong.

In the lecture, Prof. Chin shared views on the future development of BSE profession in Hong Kong. With the recent and escalating public consciousness and expectations on sustainable development issues particularly on climate change, indoor environmental quality, waste reduction and public health and safety, the future of the BSE profession would be driven by the need to cater for the above issues and the commensurate acquisition and application of technologies and knowledge. A balanced approach is proposed to be developed for the possible swings and roundabouts of everyday life.
The *Future* of the Building Services Engineering Profession in Hong Kong

Flag courtesy of 4 International Flags

Ir Prof Ronald S Chin
12 November 2010
Background

- BSE professionals in HK
- Increasing Skill sets needed
- Public’s perception of the profession
- Statutory responsibilities

Resulting in the groundbreaking research study on

*Changes for the Betterment of the Building Services Profession in Hong Kong*
Joint Research Study

- Initiated in 2006 by HKIE, BSD and BSE, HKPolyU
  “…..The Study was expected to yield findings that point toward the **appropriate direction** along which the profession should develop. In particular, it was expected to **outline the future roles** to be played and **functions** to be served by professional building services engineers in Hong Kong to augment the development of their profession, which would, at the same time, **enhance** the value of their professional services to, and **advance** their professional standing in the society. …”

- **Findings based on** - Surveys, Interviews and open fora

- **Report Published in May 2010**
Joint Research Study Directions

BSE’s should be ‘generalists’ and/or ‘specialists’ in which -

- no difference in Academic training
- Specialization commences after basic training
- Generalists mediate communications between others (incl. Specialists, other professionals, clients, lay persons)
Some Examples of the Joint Research Study Recommendations (1)

- Professional BSEs should each play the roles of both a ‘specialist’ and a ‘generalist’ efficiently and to be more innovative and be able to effectively communicate ideas with project clients and other building professionals.

- To give higher priority to energy efficiency and sustainability of buildings.

- To involve professional BSEs in regulatory controls over building services works in Hong Kong.

- Attention to relevant developments in China, which could affect the professional practices and the statutory role of professional building services engineers in Hong Kong.

- Professional institutions review and update their requirements for admission of corporate members and for accreditation of building services engineering programmes, and should join hands with higher education institutes to offer suitable CPD programmes.
Some Examples of the Joint Research Study Recommendations (2)

- To put in place a **proper management** and **quality assurance system** for the T&C process

- To pay greater attention to retrofitting existing buildings and to **proper O&M** of building services systems

- To arouse the **general public’s attention** to the contributions of BSEs, and to attract **good calibre** school leavers to choose building services engineering programmes for higher education, professional institutions and universities should promote the BSE profession
Recent Public Concerns

- Environment
  - Climate change
  - Air Quality
  - Waste Management

- Economics
  - Property Prices
  - Economic Recovery

- Social political
  - Unemployment
  - Community Facilities
Six Economic Areas proposed by the Task Force on Economic Challenges for further development in 2008

- testing and certification
- medical services
- innovation and technology
- cultural and creative industries
- environmental industry
- educational services
Progressive Development of Issues of Concerns

- **CIBSE** acknowledges that current economic worries have potential impact on the engineering and construction sector. However, the profession will play a vital role in adapting to future challenges – the **energy efficiency** of buildings will increase in importance as people look to cut energy bills, reduce UK’s dependence on energy imports and work towards a more sustainable future.

- In January 2010 Royal Academy of Engineering (RAEng) published a report titled *Engineering a Low Carbon Built Environment - The Discipline of Building Engineering Physics*. 
RAEng Report on Built Environment

- Contains **23** Recommendations
  - 6 to the UK Government
  - 3 to the Engineering and Physical Sciences Research Council
  - 4 to the professional engineering institutions
  - 1 to the Association for Consultancy and Engineering,
  - 5 to the universities,
  - 4 regarding the role of RAEng
Progressive Development of Issues of Concerns

- **ASHRAE** – “...Sustaining our Future by Rebuilding our Past .... **Energy Efficiency** in Existing Buildings – Our Greatest Opportunity for a Sustainable Future...” by Gordon Holness, P.E., Fellow ASHRAE, Life Member, 2009-10 ASHRAE President

- **HKIE** – Committed to a Protocol of Engineering a Sustainable Hong Kong. "The protocol establishes the principles, and provides a central framework for the Institution to lead the engineering community and allied professions towards a resilient future for Hong Kong..." by Ir Dr Andrew Chan, 2009-2010 HKIE President
Progressive Development of Issues of Concerns on Sustainability

- **Sustainability (Climate Change)**
  - GHG Emissions, Energy Security/Mix, EE&C etc..
  - Building Orientation and Roofs/Facades, LCA of Building Materials etc...

- **Indoor Environment Quality**
  - IAQ
  - Comfort and Productivity etc...

- **Waste Reduction**
  - Energy Recovery, Solid & Liquid Waste Treatment, Grey Water Recovery etc..

- **Public Health & Safety**
  - Electrical, Pressure Vessels, Lifts & Escalators, Fire Engineering
  - Transport, Mechanical Handling, etc..
  - Water-borne and air borne disease, etc..

- **Green Buildings**
  - O&M of Buildings and Intelligent Buildings
  - Benchmarking of Buildings
Energy Efficiency in Buildings
Fire Safety Engineering
A High-Performance Green Building –

Designed, constructed and capable of operated with increasing environmental performance and economic value over time

Establishes an IEQ supporting health, satisfaction and productivity of occupants
International Green Construction Code
ANSI/ASHRAE/USGBC/IESNA Standard 189.1 – 2009
Standard for the Design of High-Performance Green Buildings
Maintenance of Buildings and Intelligent Buildings
Examples of Trends in Knowledge and Technologies Affecting BSE Profession

- Wider Use of Magnetic bearings
- *Smart* Wireless Sensors and Controllers
- Low footprint and *Smart* HVAC - e.g., Compact A/C, fully Integrated A/C Controls
- ‘Low Carbon Lifecycle’ Lighting – e.g., OLED, Electron Stimulated Luminescence™ (ESL)
- *Smart* Grids
- Higher Efficiency Photovoltaics
Motor with Magnetic Bearing
Examples of Higher Efficiency Photovoltaics in Production

<table>
<thead>
<tr>
<th>Generic Type</th>
<th>Special Feature</th>
<th>Conversion efficiency</th>
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<tbody>
<tr>
<td>Silicon Solar Cells</td>
<td>Power connections at backside</td>
<td>Cell 24.2%</td>
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<td></td>
<td></td>
<td>Module 19.5%</td>
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<tr>
<td>Amorphous Silicon</td>
<td>Mono-cell surrounded layers of amorphous silicon</td>
<td>Cell 20.7%</td>
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<tr>
<td></td>
<td></td>
<td>Module 18.2%</td>
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<tr>
<td>Multicrystalline Silicon</td>
<td>Cells behind modular glass with pyramid-shaped</td>
<td>Cells 17%</td>
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<tr>
<td>Cells</td>
<td>structures</td>
<td>Modules 15.4%</td>
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<tr>
<td>Thin film Cells</td>
<td>CIS</td>
<td>Cells 20.3%</td>
</tr>
<tr>
<td></td>
<td>Still low in production scale</td>
<td></td>
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<tr>
<td></td>
<td>Good potential for BIPV</td>
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Solarpeq – International Trade for Solar Production Equipment Dusseldorf, Germany held from 28 Sep to 1 Oct 2010
Developing better Dissemination of Knowledge
Trends in Hong Kong Affecting BSE

Gross value of construction works performed by main contractors analysed by broad trade group at constant 2000 market prices (data from C & S D)

- Private developers & PSPS projects sites in $bn
- Public sector (incl. SARG, MTR and HOS) sites in $bn
- Locations other than sites in $bn
- All groups in $bn

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<tr>
<td>2000</td>
<td>$34.1 bn</td>
<td>$27.6 bn</td>
<td>$40.7 bn</td>
<td>$102.4 bn</td>
</tr>
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Graph shows the trend over the years from 2000 to 2014 for each category.
Trends in Hong Kong Affecting BSE

- **Value of govt. bldg. projects under design & construction $bn**: Average $63.2 bn
- **Govt. subvented bldg. projects expenditure $bn**: Average $33.4 bn
- **Total private sector completed bldg. cost $bn**:
- **New govt. bldg. projects expenditure $bn**:
- **Thousands of public housing Flats completed**: Average 23,500 flats

Data from Hong Kong Yearbooks and Govt. Annual Budget Estimates
Effects on BSE Profession

- Greener buildings
deviation and operation
- Higher Performance
  for high grade commercial and public sector buildings
- Higher Level of Skills Required
  Conducting Jobs Surveys for BSEs
- Greater Need for Inter and Intra Disciplinary Exchanges
- Swings and Roundabouts
Jobs & Salaries Surveys
Future Developments

Results of the Consultation in Climate Change Strategy and Action Agenda on

- Energy Mix
- Enhanced Energy Efficiency for Buildings - mandatory control
- Transport energy
- Low Carbon Economy Living
Some Probable Enhanced Roles

- The Building Project’s Sustainability Co-ordinator/Project Manager for new buildings

- The Property/Facility Manager for Sustainability Issues of existing buildings

- The Sustainability Manager for Corporate Enterprises

- The (mandated or perceived) authority having jurisdiction over matters relating to climate change issues for building energy and IEQ issues
Possible Outlook for BSE Profession

- Business As Usual – *Low* Possibility
- Reduced Roles – *Very Low* Possibility
- Greatly Enhanced Roles – *Very Low* Possibility
- Some Enhanced Roles – *Very Likely*
Thank You
and
Q & A