



ACADEMY OF ENGINEERING  
SINGAPORE

E d i t i o n

# n a u g u r a l

N e w s l e t t e r



**We have chosen our strategic priorities of celebrating engineering excellence, to inspire the next generation of engineers, and to lead discussion by guiding informed thinking on engineering related public policies.**

**Professor Cham Tao Soon**  
President  
Academy of Engineering, Singapore

## President's Foreword



As Singapore's national academy for engineering, we bring together the country's most eminent engineers from all sectors to promote excellence in the practice of engineering. We can tap on the expertise and experience of more than seventy Fellows.

We have chosen our strategic priorities of celebrating engineering excellence, to inspire the next generation of engineers, and to lead discussion by guiding informed thinking on engineering related public policies.

In my opinion each of the strategies provides a key contribution to a strong and vibrant engineering sector and in the well-being of society.

Excellence celebration is made through recognition of good work by our engineers. It could be the design and construction of green buildings or the MRT networks. There are many opportunities to create for the benefit of society both in the software and hardware systems. We have to do more to publicise the achievements either through the media or giving awards. The Institution of Engineers Singapore is already giving special awards to engineering achievements. Technological achievements are also recognised by the yearly awards of A\*STAR (Agency for Science, Technology and Research). At a later date, it would be good if the Academy could work out a national strategy of recognising the achievements of engineers.

The future of engineering in Singapore will depend on whether the next generation of engineers is of the highest calibre. More of the bright young students need to be attracted to study engineering and then embark on a variety of engineering careers. To inspire them through the interesting and challenging possibilities of technology, the Science Centre needs to showcase many of the breakthroughs in engineering innovations. While scientific principles are important, an exhibition of the applications is often easier to relate to the experience of the young.

Another role of the Academy is to inspire the young students by showcasing the achievements of the Fellows. The Fellows are the eminent engineers who have succeeded in a variety of careers. The message to the young is the study of engineering can lead progressively to many different and interesting careers.

Capitalising on the experience and expertise of our Fellows, the Academy will conduct informed thinking on selected public policies. It will provide a forum for the mutual exchange of ideas of Fellows and pursue effective engagement with agencies and interested parties. One on-going policy study is on energy requirements of Singapore. We hope the Academy can advocate progressive and forward-looking policies and contribute to the economic development of the nation.

**Professor Cham Tao Soon**

## Our Mandate

The Academy of Engineering, Singapore (SAEng) was founded in 2011 by a small group of eminent engineers to provide leadership among engineering professionals, and to advance engineering education and promote engineering excellence in Singapore. The Academy aims to strengthen Singapore's skills and knowledge base in order to support the long-term development of the nation.

One of the mandates of the Academy is to serve as a think tank or forum to deliberate on national agenda and hot-button issues related to the engineering profession. Leveraging the experience and expertise of its fellow members, the Academy steers initiatives in areas of strategic importance to the Republic, contributing to the nation's quest to meet the challenges of the new millennium and to build a vibrant engineering community in Singapore.



## Our Logo

The SAEng logo reflects the Academy's standing as a reputable and esteemed institution, committed to advancing excellence in all aspects of engineering and engineering technology education.

The abstract initial letters "e" and "s" represent engineering in Singapore, while the vibrant red swirls signify the resolve and passion in providing thought leadership in charting new pathways to engineering and scientific development, and promoting engineering education and excellence to advance the human condition.

The iconic logo mark symbolises cooperation and dynamism.

## The Constitution

### Name

- 1.1 Society shall be known as the "Academy of Engineering, Singapore", hereinafter referred to as the "Academy".

### Place of Business

- 2.1 Its place of business shall be at "c/o Institution of Engineers, 70 Bukit Tinggi Road, Singapore 289758" or such other address as may subsequently be decided upon by the Committee and approved by the Registrar of Societies.

### Objects

- 3.1 Its object is:
  - a) Helping to strengthen Singapore's skills and knowledge base in order to support the long-term development of industry and society
- 3.2 The Academy will bring further benefits to Singapore, including:
  - a) Advance and promote excellence in engineering
  - b) Work to improve public awareness and understanding of engineering
  - c) To use international partnerships to ensure that Singapore benefits from international networks, expertise and investment
  - d) Helping to strengthen Singapore's skills and knowledge base in order to support the longterm development of industry and society
- 3.3 In furtherance of the above objects, the Academy may do all such things which are incidental or conducive to the attainment of the objects, and particularly as follows:
  - a) Monitoring, analysing and evaluating technological / economic developments and potentials in Singapore and globally
  - b) Initiating and conducting studies of technical and economic issues
  - c) Advising on engineering education, research, development and innovation
  - d) Developing and maintaining effective relations with other professional engineering organisations, academies and learned societies in Singapore, and abroad

- e) Recognising excellence in engineering contributions to the Singapore economy

### Statement of Faith<sup>†</sup>

Please attach the statement of faith of the Society as an Annex.

- <sup>†</sup> Compulsory for Churches. Please delete where inapplicable.
- <sup>★</sup> Compulsory for Religious Bodies. Please delete where inapplicable.

### Membership Qualification and Rights

- 4.1 Membership (Fellow) is open to Singaporeans and foreigners residing in Singapore subject to rigorous peer review and sponsorship by the existing Fellows of the Academy.

Fellows shall be prominent engineers, engineering scientists, public officials and leaders of the academic and business communities involved with engineering. At any time, there should be no more than 100 Fellows who are below the age of 70.

- 4.2 The Academy may elect no more than 10 Honorary Fellows. The Academy may also elect Foreign Fellows. Elected Fellows who no longer reside in Singapore shall be transferred to the category of Foreign Fellows.
- 4.3 All Fellows shall have the right to vote and to hold office in the Academy.
- 4.4 Fellows of the Academy are entitled to use FSEng after their names.

### Nomination for Membership

- 5.1 A person must be nominated by his peers to join the Academy through a nomination process defined in the Bye-laws.
- 5.2 A Review Panel will be formed to assess every new nomination. The nominee may also be required to attend an interview by the Panel Members.
- 5.3 A copy of the Academy Constitution shall be furnished to every Fellow.

### Entrance Fees, Subscriptions and Other Dues

- 6.1 There shall be no entrance fee payable for all Fellows admitted.
- 6.2 There shall be no subscriptions payable by the Fellows. The funds of the Academy shall be derived from free-will offerings.

- 6.3 The income and property of the Academy whensoever derived shall be applied towards the promotion of the objects of the Academy as set forth in this Constitution and no portion thereof shall be paid or transferred directly or indirectly by way of dividend or bonus or otherwise howsoever by way of profit to the persons who at any time are or have been members of the Academy or to any of them or to any person claiming through any of them.

### Supreme Authority and General Meetings

- 7.1 The supreme authority of the Academy is vested in a General Meeting of the Fellows.
- 7.2 An Annual General Meeting shall be held in September each year and no later than 15 months from the last AGM.
- 7.3 At other times, an Extraordinary General Meeting must be called by the President on the request in writing of not less than 25% of the total voting membership or thirty (30) voting members, whichever is the lesser, and may be called at anytime by order of the Committee.

The notice in writing shall be given to the Secretary setting forth the business that is to be transacted. The Extraordinary General Meeting shall be convened within two (2) months from receiving this request to convene the Extraordinary General Meeting.

- 7.4 If the Committee does not within two (2) months after the date of the receipt of the written request proceed to convene an Extraordinary General Meeting, the Fellows who requested for the Extraordinary General Meeting shall convene the Extraordinary General Meeting by giving ten (10) days' notice to voting Fellows setting forth the business to be transacted and simultaneously posting the agenda on the Academy's notice board.
- 7.5 At least two (2) weeks' notice shall be given of an Annual General Meeting and at least ten (10) days' notice of an Extraordinary General Meeting. Notice of meeting stating the date, time and place of meeting shall be sent by the Secretary to all voting Fellows. The particulars of the agenda shall be posted on the Academy's notice board four (4) days in advance of the meeting.

- 7.6 Unless otherwise stated in this Constitution, voting by proxy shall not be allowed at all General Meetings.
- 7.7 The following points will be considered at the Annual General Meeting:

a) The previous financial year's accounts and annual report of the Committee.

b) Where applicable, the election of office-bearers and Honorary Auditors for the following term.

Any Fellow who wishes to place an item on the agenda of a General Meeting may do so provided he gives notice to the Secretary one (1) week before the meeting is due to be held.

- 7.8 At least 25% of the total voting membership or thirty (30) voting Fellows, whichever is the lesser, present at a General Meeting shall form a quorum. Proxies shall not be constituted as part of the quorum.
- 7.9 In the event of there being no quorum at the commencement of a General Meeting, the meeting shall be adjourned for half an hour and should the number then present be insufficient to form a quorum, those present shall be considered a quorum, but they shall have no power to amend any part of the existing Constitution.

#### Management and Committee

- 8.1 The administration of the Academy shall be entrusted to a Committee consisting of the following to be elected at alternate Annual General Meeting:

A President

A Vice-President

A Secretary

A Treasurer

An Ex-officio – President IES

Ordinary Committee Members

- 8.2 Names for the above offices shall be proposed and seconded at the Annual General Meeting and election will follow on a simple majority vote of the members. All office-bearers, except the Treasurer may be re-elected to the same or related post for a consecutive term of office. The term of office of the Committee is two years.
- 8.3 Election will be either by show of hands or, subject to the agreement of the majority of the voting members present, by a secret ballot.
- 8.4 A Committee Meeting shall be held at least once every three months after giving seven (7) days' notice to Committee Members. The President may call a Committee Meeting at any time by giving five (5) days' notice. Majority of the Committee Members must be present for its proceedings to be valid.

8.5 Any member of the Committee absenting himself from three (3) meetings consecutively without satisfactory explanations shall be deemed to have withdrawn from the Committee and a successor may be co-opted by the Committee to serve until the next Annual General Meeting. Any changes in the Committee shall be notified to the Registrar of Societies and the Commissioner of Charities within two (2) weeks of the change.

8.6 The duty of the Committee is to organise and supervise the daily activities of the Academy. The Committee may not act contrary to the expressed wishes of the General Meeting without prior reference to it and shall always remain subordinate to the General Meetings.

- a) Whenever a member of the Board/Management Committee is in any way, directly or indirectly, has an interest in a transaction or a project or other matter to be discussed at a meeting, the member shall disclose the nature of his interest before the discussion on the matter begins
- b) The member concerned should not participate in the discussion or vote on the matter, and should also offer to withdraw from the meeting and the Board/Management Committee shall decide if this should be accepted

#### Duties of Office-Bearers

- 9.1 The President shall chair all General and Committee meetings. He shall also represent the Academy in its dealings with outside persons.
- 9.2 The Vice-President shall assist the President and deputise for him in his absence.
- 9.3 The Secretary shall keep all records, except financial, of the Academy and shall be responsible for their correctness. He will keep minutes of all General and Committee meetings. He shall maintain an up-to-date Register of Fellows at all times.
- 9.4 The Treasurer shall keep all funds and collect and disburse all moneys on behalf of the Academy and shall keep an account of all monetary transactions and shall be responsible for their correctness. He is authorised to expend up to \$2,000 per month for petty expenses on behalf of the Academy. He will not keep more than \$1,000 in the form of cash and money in excess of this will be deposited in a bank to be named by the Committee. Cheques, etc. for

withdrawals from the bank will be signed by the Treasurer and either the President or the Vice-President of the Academy.

### **Audit and Financial Year**

10.1 Two (2) voting Fellows, not being members of the Committee, shall be elected as Honorary Auditors at alternate Annual General Meeting and will hold office for a term of two years only and shall not be re-elected for a consecutive term. The accounts of the Academy shall be audited by a firm of Certified Public Accountants if the gross income or expenditure of the Academy exceeds \$500,000 in that financial year, in accordance with Section 4 of the Societies Regulations.

10.2 They:

- a) Will be required to audit each year's accounts and present a report upon them to the Annual General Meeting
- b) May be required by the President to audit the Academy's accounts for any period within their tenure of office at any date and make a report to the Committee

10.3 The financial year shall be from January 1st to December 31st.

### **Trustees**

11.1 If the Academy at any time acquires any immovable property, such property shall be vested in trustees subject to a declaration of trust.

11.2 The trustees of the Academy shall:

- a) Not be more than four (4) and not less than two (2) in number
- b) Be elected by a General Meeting of Fellows
- c) Not effect any sale or mortgage of property without the prior approval of the General Meeting of Fellows

11.3 The office of the trustee shall be vacated:

- a) If the trustee dies or becomes a lunatic or of unsound mind
- b) If he is absent from the Republic of Singapore for a period of more than one (1) year
- c) If he is guilty of misconduct of such a kind as to render it undesirable that he continues as a trustee

d) If he submits notice of resignation from his trusteeship

11.4 Notice of any proposal to remove a trustee from his trusteeship or to appoint a new trustee to fill a vacancy must be given by posting it on the notice board in the Academy's premises at least two (2) weeks before the General Meeting at which the proposal is to be discussed. The result of such General Meeting shall then be notified to the Registrar of Societies and the Commissioner of Charities.

11.5 The address of each immovable property, name of each trustee and any subsequent change must be notified to the Registrar of Societies and the Commissioner of Charities.

### **Prohibitions**

12.1 Gambling of any kind, excluding the promotion or conduct of a private lottery which has been permitted under the Private Lotteries Act Cap 250, is forbidden on the Academy's premises. The introduction of materials for gambling or drug taking and of bad characters into the premises is prohibited.

12.2 The funds of the Academy shall not be used to pay the fines of Fellows who have been convicted in court of law.

12.3 The Academy shall not engage in any trade union activity as defined in any written law relating to trade unions for the time being in force in Singapore.

12.4 The Academy shall not indulge in any political activity or allow its funds and/or premises to be used for political purposes.

12.5 The Academy shall not hold any lottery, whether confined to its Fellows or not, in the name of the Academy or its office-bearers, Committee or members unless with the prior approval of the relevant authorities.

12.6 The Academy shall not raise funds from the public for whatever purposes without the prior approval in writing of the Assistant Director Operations, Licensing Division, Singapore Police Force and other relevant authorities.

### **Amendments to Constitution**

13.1 The Academy shall not amend its Constitution without the prior approval in writing of the Registrar of Societies and the Commissioner of Charities. No alteration or addition/deletion to this Constitution

shall be passed except at a general meeting and with the consent of two-thirds (2/3) of the voting Fellows present at the General Meeting.

### Interpretation

14.1 In the event of any question or matter pertaining to day-to-day administration which is not expressly provided for in this Constitution, the Committee shall have power to use their own discretion. The decision of the Committee shall be final unless it is reversed at a General Meeting of members.

### Disputes

15.1 In the event of any dispute arising amongst Fellows, they shall attempt to resolve the matter at an Extraordinary General Meeting in accordance with this Constitution. Should the Fellows fail to resolve the matter, they may bring the matter to a court of law for settlement.

15.2 In the event that the Society ceases to be a registered charity under the Charities Act, all debts, liabilities legally incurred on behalf of the Society shall be fully discharged, and the remaining funds will be contributed to charitable organisations with similar objectives in Singapore which are registered under the Charities Act as the members of the Society may determine at the general meeting, unless otherwise allowed by the Commissioner of Charities

### Dissolution

16.1 The Academy shall not be dissolved, except with the consent of not less than three-fifths (3/5) of the total voting membership of the Academy for the time being resident in Singapore expressed, either in person or by proxy, at a General Meeting convened for the purpose.

16.2 In the event of the Academy being dissolved as provided above, all debts and liabilities legally incurred on behalf of the Academy shall be fully discharged, and the remaining funds will be donated to charitable organisations with similar objectives in Singapore which are registered under the Charities Act as the General Meeting of members may determine.

16.3 A Certificate of Dissolution shall be given within seven (7) days of the dissolution to the Registrar of Societies and the Commissioner of Charities.

### Annex

For the categories of societies listed below, the majority of the Committee Members must be Singapore Citizens. In addition, the President, Secretary, Treasurer and their deputies shall be Singapore Citizens or Singapore Permanent Residents. Foreign Diplomats shall not serve as Committee Members.

- a) Religious societies
- b) Societies which identify themselves publicly as or whose membership is confined exclusively to members of a single racial group
- c) Any society whose object, purpose or activity, whether primary or otherwise, is to represent; promote any cause or interest of; or discuss any issue relating to a class of persons defined by reference to their gender or sexual orientation
- d) Any society whose object, purpose or activity, whether primary or otherwise, is to represent persons who advocate; promote; or discuss any issue relating to any civil or political right (including human rights, environmental rights and animal rights)
- e) Any society whose object, purpose or activity, whether primary or otherwise, is to promote or discuss the use or status of any language

### Our Executive Committee (2013-2015)

The Executive Committee comprises the following members elected at the third Annual General Meeting:

President	<b>Cham Tao Soon</b>
Vice-President	<b>Low Teck Seng</b>
Secretary	<b>Freddy Boey</b>
Assistant Secretary	<b>Yoon Soon Fatt</b>
Treasurer	<b>Andrew Nee Yeh Ching</b>
Ex-officio – President IES	<b>Chou Siaw Kiang</b>
Ordinary Member	<b>Chan Eng Soon</b>
Ordinary Member	<b>Hang Chang Chieh</b>
Ordinary Member	<b>Ho Siong Hin</b>

## Our Distinguished Academy Fellows

As at 28 February 2014, the Academy of Engineering, Singapore (SAEng) has elected 81 prominent personalities to the Academy Fellowship. Fellows are elected through a rigorous peer-review process that evaluates individuals on the basis of their stellar leadership and career

achievements in the field of engineering across all disciplines. SAEng is proud to formally introduce the eminent engineers, engineering scientists, public officials and distinguished leaders of the academic and business communities elected as Fellows of the Academy.



**Freddy Boey**  
Deputy President and Provost  
Nanyang Technological University



**Cham Tao Soon**  
Chancellor  
SIM University



**Chan Eng Soon**  
Dean  
Faculty of Engineering  
National University of Singapore



**Chang Meng Teng**  
Chairman  
Squire Mech Pte Ltd



**Chen Charng Ning**  
Emeritus Professor  
School of Civil & Environmental Engineering  
Nanyang Technological University



**Cheng Tee Hiang**  
Associate Chair (Faculty)  
School of Electrical & Electronic Engineering  
Nanyang Technological University



**Cheong Hee Kiat**  
President  
SIM University



**Chew Choon Seng**  
Chairman  
Board of Directors  
Singapore Exchange Ltd



**Chew Tuan Chiong**  
Chief Executive Officer and Executive Director  
Frasers Centrepoint Asset Management Ltd



**Chew Yong Tian**  
Deputy Executive Director  
Institute for Engineering Leadership  
Faculty of Engineering  
National University of Singapore



**Chiang Chie Foo**  
Chairman  
Rowsley Ltd



**Chong Tow Chong**  
Provost  
Singapore University of Technology & Design



**Choo Chiau Beng**  
Senior Adviser  
Keppel Corporation



**Chou Siaw Kiang**  
Executive Director  
Energy Studies Institute  
National University of Singapore



**Chua Kee Chaing**  
Head  
Department of Electrical & Computer Engineering  
National University of Singapore



**Chua Koon Hoe**  
Former President  
Professional Engineers Board



**Neal Chung Tai-Shung**  
Provost Chair Professor  
Department of Chemical & Biomolecular Engineering  
National University of Singapore



**Er Meng Hwa**  
Vice President (International Affairs)  
Nanyang Technological University



**Sam Ge Shuzhi**  
Professor  
Department of Electrical & Computer Engineering  
Director  
Social Robotics Lab  
Interactive Digital Media Institute  
National University of Singapore



**Angela Goh Eck Soong**  
Associate Provost (Faculty Affairs)  
Nanyang Technological University



**Goh Thong Ngee**  
Professor  
Department of Industrial & Systems Engineering  
National University of Singapore



**Hang Chang Chieh**  
Executive Director  
Institute for Engineering Leadership  
Faculty of Engineering  
National University of Singapore



**Ho Ching**  
Executive Director and Chief Executive Officer  
Temasek Holdings



**Peter Ho Hak Ean**  
Senior Advisor  
Centre for Strategic Futures



**Ho Siong Hin**  
 Commissioner for Workplace Safety and Health  
 Divisional Director  
 Occupational Safety & Health Division  
 Ministry of Manpower



**Kam Chan Hin**  
 Associate Provost (Undergraduate Education)  
 Nanyang Technological University



**Koh Boon Hwee**  
 Chairman  
 Credence Partners Pte Ltd



**Alex Kot Chichung**  
 Associate Dean (Graduate Studies)  
 College of Engineering  
 Nanyang Technological University



**Kwa Chong Seng**  
 Chairman  
 Singapore Technologies Engineering Ltd



**Lam Khin Yong**  
 Chief of Staff  
 Nanyang Technological University



**Lee Bee Wah**  
 Group Director  
 Meinhardt (Singapore) Pte Ltd



**Brian Lee Chang Leng**  
 Founding Dean  
 School of Electrical & Electronic Engineering  
 Nanyang Technological University



**Lee Ek Tieng**  
 Former Permanent Secretary  
 Ministry of the Environment  
 Former Chairman  
 Public Utilities Board  
 Former Head of Civil Service



**Lee Fook Hou**  
 Co-Chairman  
 Centre for Protective Technology  
 Faculty of Engineering  
 National University of Singapore



**Moses Lee**  
 Chairman  
 Singapore Totalisator Board  
 Chairman  
 Sentosa Development Corporation



**Lee Seng Lip**  
 Emeritus Professor  
 Department of Civil & Environmental Engineering  
 National University of Singapore



**Lee Tong Heng**  
 Professor  
 Department of Electrical & Computer Engineering  
 National University of Singapore



**Lian Yong**  
 Provost Chair Professor and Area Director  
 Integrated Circuits and Embedded Systems  
 Department of Electrical & Computer Engineering  
 National University of Singapore



**Richard Liew Jat Yuen**  
Professor  
Department of Civil & Environmental Engineering  
National University of Singapore



**Liew Mun Leong**  
Provost Chair Professor (Practice)  
National University of Singapore



**Lim Chee Onn**  
Senior International Adviser  
Singbridge Pte Ltd



**Lim Soon Hock**  
Founder and Managing Director  
PLAN-B ICAG Pte Ltd



**Isabella Loh**  
Chairman  
Singapore Environment Council  
Chairman  
Practising Management Consultant (PMC)  
Certification Board (SBACC)



**Low Sin Leng**  
Senior Advisor  
Sembcorp Development Ltd



**Low Teck Seng**  
Chief Executive Officer  
National Research Foundation



**Lui Pao Chuen**  
Advisor  
National Research Foundation



**Andrew Nee Yeh Ching**  
Professor  
Department of Mechanical Engineering  
National University of Singapore



**Ng Wun Jern**  
Executive Director  
Nanyang Environment & Water Research Institute  
Nanyang Technological University



**Pan Tso-Chien**  
Executive Director  
Institute of Catastrophe Risk Management  
Nanyang Technological University



**Phoon Kok Kwang**  
Head and Distinguished Professor  
Department of Civil & Environmental Engineering  
National University of Singapore



**J.Y. Pillay**  
Independent Director and Chairman  
Tiger Airways Holdings Limited



**Quek Gim Pew**  
Chief Executive Officer  
DSO National Laboratories



**Quek Tong Boon**  
Chief Defence Scientist  
Ministry of Defence



**Seah Hock Soon**  
Professor and Director of gameLAB  
School of Computer Engineering  
Nanyang Technological University



**Seah Moon Ming**  
Executive Director and Group Chief Executive Officer  
Pavilion Energy Pte Ltd and  
Pavilion Gas Pte Ltd



**Inderjit Singh**  
Chief Executive Officer  
Infiniti Solutions Pte Ltd



**Soh Chee Kiong**  
Acting Chair  
School of Civil & Environmental Engineering  
Nanyang Technological University



**Thambipillai Srikanthan**  
Chair  
School of Computer Engineering  
Nanyang Technological University



**Su Guaning**  
President Emeritus  
Nanyang Technological University



**Tan Ee Ping**  
Managing Director  
TEP Consultants Pte Ltd



**Tan Gee Paw**  
Chairman  
Public Utilities Board



**Tan Kim Siew**  
Commissioner of Inland Revenue  
Inland Revenue Authority of Singapore



**Tan Pheng Hock**  
President and Chief Executive Officer  
Singapore Technologies Engineering Ltd



**William Tan Seng Koon**  
President and Chief Executive Officer  
SIA Engineering Company



**Tan Thiam Soon**  
President  
Singapore Institute of Technology



**Tang Kin Fei**  
Group President and Chief Executive Officer  
Sembcorp Industries



**Tay Tong Earn**  
Head  
Department of Mechanical Engineering  
National University of Singapore



**Teh Bong Lim**  
Founder, Managing Director  
and Executive Director  
MMI Holdings Ltd



**Teo Ming Kian**  
Chairman  
MediaCorp Pte Ltd



**Teoh Swee Hin**  
Acting Chair  
School of Chemical & Biomedical Engineering  
Nanyang Technological University



**Raj Thampuran**  
Managing Director  
Agency for Science, Technology and Research



**Ting Seng Kiong**  
Deputy President (Academic) and Provost  
Singapore Institute of Technology



**Wang Chien Ming**  
Professor  
Engineering Science Programme and  
Department of Civil & Environmental Engineering  
National University of Singapore



**Wong Lup Wai**  
Group Executive Vice President and  
Group Chief Operating Officer  
Hyflux Ltd



**Wong Ngit Liong**  
Chairman and Chief Executive Officer  
Venture Corporation Ltd



**Miranda Yap**  
Professor  
Department of Chemical & Biomolecular Engineering  
National University of Singapore



**Philip Yeo**  
Chairman  
SPRING Singapore



**Yoon Soon Fatt**  
Chair  
School of Electrical & Electronic Engineering  
Nanyang Technological University



**Yue Chee Yoon**  
Associate Provost (Graduate Education)  
Nanyang Technological University

### In Memory

The Academy honours the memory of the following Fellows who had passed on.

**Ma Jan** (Left us on 23 June 2012)

**Jacob Phang Chee Hong** (Left us on 5 January 2013)

## An Overview

Since its launch, the Academy of Engineering, Singapore (SAEng) has identified three strategic projects and called upon its fellows to lend their expertise. One of the SAEng study teams on Engineering Education has zoomed into the significant role which could be played by Science Centre Singapore. A team led by Professor Hang Chang Chieh submitted a proposal on extending the role of Science Centre Singapore in inculcating students' interests in engineering innovation. With regard to policy studies, Professor Kam Chan Hin is looking into renewing students'

interest in engineering, while Professor Chou Siaw Kiang is working with a group of young professionals in developing a clean technology road map for Singapore.

Over the past year, the Academy has made significant progress in laying the groundwork for improving the awareness of engineering in society and promoting engineering excellence. The Academy would like to acknowledge all team leaders and fellow members for their enormous effort and hard work in steering the strategic projects.



*Photo courtesy of Science Centre Singapore*

Project

Championed by

**Fellow Hang Chang Chieh**

*Executive Director  
Institute for Engineering Leadership  
National University of Singapore*

**Fellow Quek Gim Pew**

*Chief Executive Officer  
DSO National Laboratories*

**Fellow Raj Thampuran**

*Managing Director  
Agency for Science, Technology and Research*

## Enhancing the Role of Science Centre Singapore in Engineering Innovation

The Academy recognises the need to secure a substantial pipeline of engineers in Singapore through raising greater awareness and interest in the profession.

Further to the discussions with the Chief Executive Officer (CEO) of Science Centre Singapore (SCS), Professor Hang Chang Chieh and his team studied the issue extensively and prepared a white paper proposing the SCS to attract students to the engineering profession by showcasing local success stories in engineering innovation and entrepreneurship, and future engineering innovations in collaboration with local universities, research institutes and industry. The objective of the white paper is to propose ways to significantly enhance the role of SCS in inculcating students' interest in engineering innovation. A strong and sustained interest will not only motivate students to take

up engineering as a choice of study in universities, it will ensure that more will pursue engineering as a life long career.

The proposal consists of two steps (Incremental and Radical), both of which are strongly recommended for Government to invest and implement soonest in order to capture the minds and hearts of young Singaporeans. In the Incremental Step, more regular exhibits in the SCS will be added in engineering innovations which are appealing to secondary school students; they will include relevant and stimulating cases of local successes in innovation and entrepreneurship. In the Radical Step, SCS will fully embrace the stimulation and inculcation of students' interests in engineering innovation in its mission.

In line with its object of furthering the role played by the SCS in stimulating and supporting students' interest in



Photo courtesy of Science Centre Singapore

engineering, the Academy team identified the Miraikan, Japan's Museum of Emerging Science and Innovation, as a potential model for SCS to consider. A possible collaboration with the Singapore Space and Technology Association (SSTA) is also under consideration, with the working group currently examining methods of adapting their micro and nano satellites in forthcoming projects to engage primary and secondary school students.

SCS will secure substantial involvement of the Agency for Science, Technology and Research (A\*STAR) and industry in co-hosting exhibits of Singapore innovations and growing the "Maker Initiative" to attract wide attention

and help students sustain interests beyond science to engineering innovation and entrepreneurship. To ensure continuity to create impact, a 5-year support is recommended. The total 5-year proposed budget will be \$24.6 million (including the setup cost of \$6.5 million).

The white paper was circulated to the Academy Fellows for comment in November 2013. A final copy will be submitted to the CEO of SCS. The next step is for SCS to deliberate on the acceptance of the recommendations, seek the necessary government funding and drive the implementation phase. The Academy team will continue to lend its expertise should support be required in seeking government funding to implementing the recommendations.

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such as Medicine, Law and Accountancy. In view of the substantial overlap of the study with the IES Task Force on Engineering Education, there was a suggestion to merge the study by the two groups.

In the recent third Annual General Meeting of the Academy, members questioned the effectiveness of setting quotas to address Singapore's need for trained engineers. It was pointed out that there was a need to consider related issues such as the outflow of trained engineers into other service sectors and the declining demand for places in the engineering programmes offered by the local universities. The pay disparity between engineering and business graduates was highlighted again as a contributory factor to the discipline's declining demand. There was also a need

to consider this against a range of other factors such as the effect on business operating costs. There was a call to re-think the teaching of sciences and mathematics and in particular, to restore the mandatory teaching of physics in the school syllabus and the inclusion of more hands-on modules to stimulate interest. It was also important to mandate the quality of engineers as a core imperative. This can be achieved through a review and re-vamp of the current engineering curriculum, and the inclusion of early industry exposure to entrench students within the engineering profession.

The industry must also support and back these suggested initiatives for it to succeed.



Photo courtesy of Nanyang Technological University

Championed by

**Fellow Kam Chan Hin**

Associate Provost  
(Undergraduate Education)  
Nanyang Technological University

**Project**

## Study of Policies and Strategies to Revive Students' Interest in Engineering

The Academy of Engineering, Singapore (SAEng) Project Group on Reviving Student Interest in Engineering met for the first time on 24 April 2012 at the Institution of Engineers, Singapore (IES). Also present were representatives of Design Singapore Council who were invited by Professor Hang Chang Chieh to help plan the overall approach to study and discover the factors influencing students' choice of study. It was noted that the problem was not localised and that many engineering universities worldwide also faced the same declining interest of students in taking up engineering programmes.

Some of the reasons cited for students not taking up engineering programmes include tedious and tough curriculum, low pay and recognition, lack of clear understanding of what an engineer does and the 'boring' image perceived by students.

The problem statements identified are:

- 1) What students are looking for in higher education?
- 2) Why students are not pursuing engineering education
  - a) Perception
  - b) Pay
  - c) Recognition
  - d) Image
  - e) Process
- 3) What is the role of engineers in society?

It was agreed that the project was timely and that an engineering education is valuable as it provides a broad based education and many opportunities to pursue careers in other areas such as banking and finance. It was also noted that there were several groups looking at the same problem. In particular, an IES Task Force on Engineering Education with several members who are also Academy Fellows, had been brainstorming the issue.

In a meeting with the Project Team and representatives from Ministry of Manpower (MOM), Ministry of Education, Economic Development Board and members of the IES Task Force on Engineering Education, Kevin Seow of MOM shared the findings of a survey carried out by MOM on the issue. The results of the survey showed that Engineering has seen a declining share of top A level students. Furthermore, a decreasing proportion of Science students opted to study engineering. There was also significant occupational leakage as compared to other occupations. An interesting observation was the high level of regret of respondents who would have preferred to study in a different course in retrospect. It was also observed that despite being a more demanding and professional course, the profession commands only median salaries. A lively discussion on the causes for the lack of interest in engineering took place. Reasons cited include the lack of prestige in the profession, the relatively low pay and rewards of top engineers as compared to their counterparts in the other professions



Photo courtesy of Public Utilities Board

## Project

Championed by

**Fellow Chou Siaw Kiang**  
*Executive Director  
 Energy Studies Institute  
 National University of Singapore*

### Renewable Energy Alternatives for Singapore

Singapore aspires to be a climate-resilient global city that is well positioned for green growth. At present, Singapore is on track to meet our unconditional emission reduction pledge of 7-11% below business-as-usual (BAU) levels by 2020 and is further prepared to reduce our emissions by 16% from the 2020 BAU level, if there is a global agreement on climate change. Our commitments would require concerted efforts across sectors in order to go beyond early mitigation actions and considering challenges in switching to alternative forms of clean energy. In 2013, there were a number of new measures that came into force to reduce Singapore's Greenhouse Gas (GHG) emissions. Building owners are now required to step up efforts to improve energy efficiency under the Building Control Act. The Energy Conservation Act stipulates energy management practices for large energy users and the Carbon Emissions-based Vehicle Scheme is expected to produce a higher take-up for low-emission cars and taxis. Despite these efforts, clean and alternative energy remains the key barrier to Singapore's mitigation potential.

Thus, the proposal was tabled to set up a Resource Centre for Clean Energy (RECCE) to address the need to engage the community, the public and private sectors, and the institutions of higher learning. RECCE will be the platform to showcase innovations and practical solutions and to launch programmes to enthuse the young to take an interest in energy efficiency and clean energy. It is hoped that RECCE can help seed long-term interest among the young on environmental concerns and direct them towards developing innovative solutions to reduce the gap in clean and alternative energy so as to enable Singapore to meet our emission reduction pledges and contribute to the action on climate change. RECCE will also serve as a resource databank and an active forum to promote alternative energy and energy efficiency towards achieving a culture for sustainable living in a city state.

Therefore, the proposed RECCE will:

- Inculcate good environmental or energy-usage habits;
- Promote clean energy up-take in Singapore;

- Develop tool-kits and training materials on renewable and alternative energy;
- Develop information and teaching materials at various levels: primary, secondary, tertiary and professional;
- Provide advice and facilitate professional and public engagement in Do-It-Yourself (DIY) projects (e.g. project work in schools, technology demonstrations and exhibitions, competitions, etc.); and
- Produce commentaries to inform policy.

To realise these goals, the proposal outlines a multi-pronged action strategy involving schools, institutes of higher learning, and agencies. The proposal also calls for the creation of strategically located kiosks across the country to facilitate information dissemination, encourage public debate and involvement in community projects, and promote habits on a low-carbon culture. Industry, business start-ups and social enterprises are to be engaged to fund, implement and promote clean energy

demonstration projects.

After adoption by SAEng Executive Committee, the proposal was circulated to members for comments and expression of interest.

Project proponents:

**Melissa Low**

*Research Associate, Energy Studies Institute (Leader)*

**Kamakannan s/o Soundararajan**

*Energy Analyst, Energy Studies Institute*

**Augustin Boey**

*Energy Analyst, Energy Studies Institute*

**Chenfei Fu**

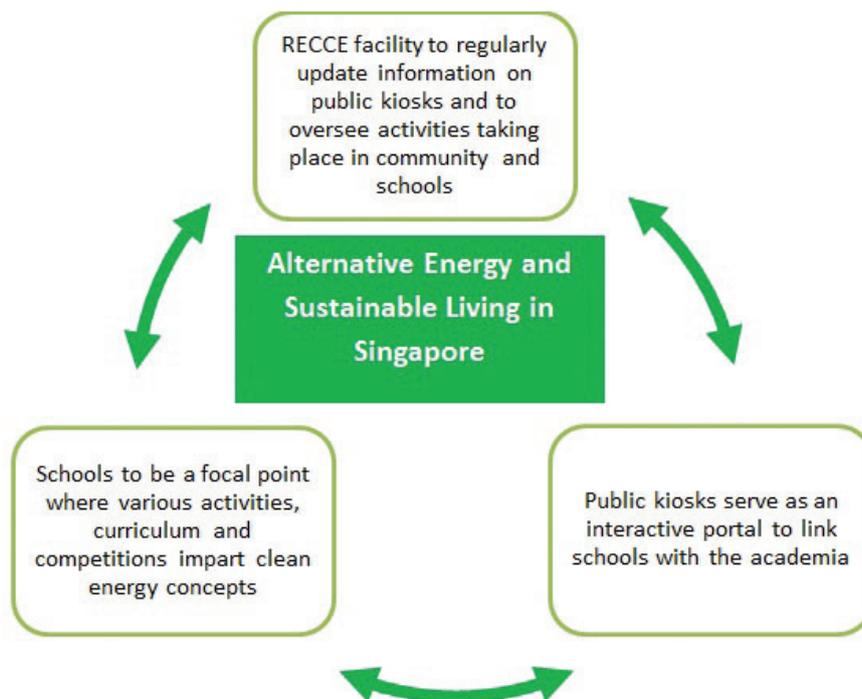
*President, Energy Carta, National University of Singapore*

**Darrell Zhang**

*Co-Founder, Intraix*

**Bryan Lee**

*Co-Founder, Intraix*



## Fellowship Certificate Presentation



At the celebration of the Institution of Engineers, Singapore (IES) 46th Annual Dinner in September 2012, Fellows of the Academy of Engineering, Singapore (SAEng) received their Fellowship certificates in a ceremony witnessed by their peers at Resorts World Sentosa.

Presenting the certificates, Patron of the Academy and Guest-of-Honour, Deputy Prime Minister Teo Chee Hean (DPM Teo) said that the SAEng Fellows played an important

role in guiding the direction of Singapore's engineering policies.

The Academy would like to extend its appreciation for the strong support of DPM Teo and IES. IES signed a memorandum of understanding with SAEng on 9 September 2011 to collaborate mutually for the advancement of engineering and benefits of engineers in Singapore. The IES President serves as an Ex-officio Member in the SAEng Executive Committee.

## Third Annual General Meeting



The Academy of Engineering, Singapore held its third Annual General Meeting (AGM) in September 2013, at the Shaw Foundation Alumni House, National University of Singapore.

During the AGM, the President proposed a re-election of the Executive Committee (ExCo). The new ExCo has two new members on board and two members re-elected to new roles.

The Secretary gave an update on the progress of the three projects initiated by the Academy. As part of the strategic plan, the Academy sought to engage in projects to promote engineering and energy sustainability, individual project

groups have since developed two papers addressing these issues, one of which has been tabled to the Academy for consultation.

The Secretary reported that the Academy's fellowship currently stands at 79 strong with the election of 6 new Fellows in 2013.

The President announced plans to produce a bi-annual publication to raise greater awareness of the Academy's activities.

The Executive Committee thanked Fellows for their attendance and support at the AGM.

## Extraordinary General Meeting

In July 2012, the Academy held its first Extraordinary General Meeting (EGM) which sought to institute the amendments endorsed by the then Ministry of Community Development, Youth and Sports (MCYS) to receive formal recognition as a charitable organisation. The proposed constitutional changes were voted in by all Fellows present.

Following the EGM, the Academy hosted its first ever Informal Fellows Gathering at Nanyang Technological University and brought together more than 35 Fellows for a night of lively exchange and networking.



## Making a Donation

The Academy of Engineering, Singapore (SAEng) is a charity entity registered in Singapore, funded by contributions from individuals and private organisations.

Your donations will enable the Academy to develop and sustain projects to attract aspiring engineers, encourage innovation and provide support to advance and

promote excellence in engineering, and improve the public awareness and understanding of engineering in Singapore.

All donations are 2.5 times tax deductible till 2015.

To make a contribution to the Academy, please contact [saeng@ntu.edu.sg](mailto:saeng@ntu.edu.sg).

## Our Donors

The Academy has received a total of \$78,470 from organisations and individual donors thus far.

We would like to express our sincere gratitude to all generous individuals and

organisations that have supported the Academy over the past three years.

Here is our 2011-2013 Honour Roll of Donors:

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### Executive Committee

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