## ASEAN Academy of Engineering and Technology (AAET) Distinguished Lecture 9 May 2015, PJ Hilton

" Challenges for Engineering in the UN Sustainable Development Goals (SDGs) 2016-2030: South-South Cooperation for SDG No. 9 and SDG No.4 "

> By Academician Dato Ir. (Dr) Lee Yee Cheong Founder President, AAET

At the Turn of the Millennium, the UN Summit General Assembly adopted the 8 UN Millennium Development Goals (MDGs) 2000-2015 to address global poverty and its attendant ills.

- **Goal 1: Eradicate poverty and hunger**
- **Goal 2: Achieve universal primary education**
- **Goal 3: Promote gender equality and empower women**
- **Goal 4: Reduce child mortality**
- **Goal 5: Improve maternal health**
- Goal 6: Combat HIV/AIDS, malaria and other diseases
- **Goal 7: Ensure environmental sustainability**
- **Goal 8: Develop a global partnership for development**

### **MDGs 2000-2015**

- Unambitious: Target to reduce global poverty, hunger, chronic diseases etc only by half;
- Silo-like: No Cross Cutting Issues like Youth Employment, Energy, SME;
- Government-centric: Private Sector and NGO not direct stakeholders.

MDGs were promoted by G7 and mainly addressed their soft development issues like education, health, gender, human right and the environment. MDG targets were constrained by their inadequate development assistance funding with their caveat to developing countries not to expect more.

MDGs do not provide solutions for the urgent problem of the developing world, namely poverty eradication through gainful wealth and employment creation.



Science, Technology, and Innovation

Innovation: applying knowledge in development



Achieving the Millennium Development Goals

The shortcomings of the MDGs were redressed somewhat by the UN Millennuim Project Science, Technology and Innovation Task Force.

# I was co-chair and co-lead author of UN MP STI Task Force publication.

It can be downloaded from:

http://www.unmillenniumproject.org/ reports/tf\_science.htm





**UN Millennium Project Task Force Leaders with UN Sec-General Kofi Annan** 

### **Recommendations of the UN MP STI Task Force:**

- For employment and wealth creation, developing countries must first build basic infrastructure like energy, water, waste water, transportation, housing education and health facilities as well as virtual connectivity through ICT. These facilitate direct foreign investment which will lead to the spread of indigenous small and medium enterprises (SMEs) for employment and wealth creation.
- SMEs are the backbone of domestic manufacture that ensures economic uplift and promote commerce and trade.

### MDGs 2000-2015 will be replaced by UN SDGs 2016-2030:

**Goal 1: End poverty in all its forms everywhere;** 

Goal 2: End hunger, achieve food security and improved nutrition, and promote sustainable agriculture;

**Goal 3: Ensure healthy lives and promote well-being for all at all ages; Goal 4: Ensure inclusive and equitable quality education and promote life-long learning opportunities for all;** 

Goal 5: Achieve gender equality and empower all women and girls;

**Goal 6: Ensure availability and sustainable management of water and sanitation for all;** 

Goal 7: Ensure access to affordable, reliable, sustainable, and modern energy for all;

Goal 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all;

**Goal 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation;** 

Goal 10: Reduce inequality within and among countries;

- Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable;
- Goal 12: Ensure sustainable consumption and production patterns;
- Goal 13: Take urgent action to combat climate change and its impacts; Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development;
- Goal 15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss; Goal 16: Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels;

Goal 17: Strengthen the means of implementation and revitalize the global partnership for sustainable development. http://sustainabledevelopment.un.org/focussdgs.html

The SDGs are holistic, cross-discipline and multi-stakeholder in participation. They break new ground with additional goals on inequalities, economic growth, decent jobs, cities and human settlements, industrialization, energy, climate change, sustainable consumption and production, peace, justice and institutions."

The SDGs boldly proclaim end of global poverty by 2030!

The SDGs are the outcome of an inclusive consultation involving all UN Member States, the entire UN System, Experts, Civil Society, Business and millions of people from all corners of the world since Rio+20 in 2012.

In December 2014, the UN announced the completion of the multistakeholder consultation process with UN Secretary-General Ban Ki-Moon issuing his Synthesis Report on the Post-2015 Development Agenda entitled "The Road to Dignity by 2030: Ending Poverty, Transforming All Lives and Protecting the Planet". <u>http://sustainabledevelopment.un.org/content/documents/5527SR\_advan</u> <u>ce%20unedited\_final.pdf</u>

The Synthesis Report repeatedly emphasizes the important role of technology in achieving the SDGs by 2030.

In my view, the drastic transformation from MDGs to the SDGs has been brought about by the dramatic social and economic uplift since the turn of this century by South countries through infrastructure construction, domestic manufacture, industrialisation and trade and commerce.

The most striking examples have been China, the Asian Tigers and some ASEAN Countries.

South-South Cooperation through BRICS and Institutions like the BRICS Development Bank, Asian Infrastructure Investment Bank and Regional Economic Communities like ASEAN, EAEC, WAEC and MERCUSOR will be the principal engines for South countries and the World to achieve the UN SDGs. This has been the most important message from the 60<sup>th</sup> Anniversary Bandung Conference April 2015. In the context of AAET, I would like to single out first SDG No 9: "Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation." and then SDG No.4 "Ensure inclusive and equitable quality education and promote life-long learning opportunities for all".

In SDG No. 9, Infrastructure is linked to Industrialisation and Innovation. Contrary to the widespread belief that Innovation is the fruit of R&D in academia, SDG No.9 affirms that Innovations that create wealth and employment happens mostly in industry throughout the world. SDG No. 9 also acknowledges that infrastructure development is the foundation for economic and social development of any country, particularly a developing country. The industry with which infrastructure development is intimately connected is the construction industry.

**Global Construction Industry Outlook** 

According to UK Government Report "Industrial Strategy: Government and Industry in Partnership-Construction 2050" July 2013 : "The global construction market is forecast to grow by over 70% by 2025. The global construction industry is set to see growth of 4.3% per annum until 2025, concentrated primarily in emerging economies.

http://www.ecobuild.co.uk/files/industry\_strategy\_to\_2025.pdf



Source: Bureau of Economic Analysis, NIPA Table 1.1.5, lines 10 and 12.

### http://www.cepr.net/index.php/graphic-economics/graphic-economics/constructionas-percent-of-gdp-2005-2011

Due to the global financial crisis of 2008, construction as % GDP declined from 9% in 2006 to 5 % in 2011.

In 2012, global GDP amounted to about 72.6 trillion U.S. dollars.

At 4.3 %, the global construction industry annual turnover will amount to some 3.1 trillion US dollars!

UK is not alone amongst the countries of the developed world in strategizing how to get a slice of this juicy construction pie!

### **Construction Outlook in Developed World**

The shift from manufacturing and construction to ICT and financial services in the past few decades has weakened the construction industry in the developed world.

In my area of electric power, the iconic manufacturing giants like Westinghouse, Parsons have been sold. In UK, electric power and water utilities have become foreign owned.

Without the support of their own manufacture and their weak development financing support base, their civil engineering construction cannot match the turnkey packaging of emerging giants like China. The infrastructure in their own countries is very old and badly in need of modernisation and reinforcement.

The developed world suffers from a surfeit of democracy. Public hearings on new infrastructure projects drag on and on because of the "not in my backyard" mentality. Their political governance system is subject to too many elections and changes of government with many twists and turns on investment in infrastructure. Their political ethos is "no new taxes but more services".

I would venture to predict that their own infrastructure will be built by construction corporations from the developing world, especially China.

As a striking example, in the US \$4 trillion 2015 budget of President Obama, he mentioned he would rely on large tax increases on corporations and the wealthy, to finance efforts in education, infrastructure construction and work force development.

He emphasized "a 21st-century infrastructure that creates jobs for thousands of construction workers and engineers, connects hard-working Americans to their jobs, and makes it easier for businesses to transport goods". President Obama wants to spend \$478 billion on transportation and infrastructure over six years.

According to the New York Times, President Obama's budget proposal on tax increase and budget deficit to finance infrastructure development will be strongly opposed by the Republicans who control both Houses in Congress.

### **Construction Outlook in China and Asia**

In global construction, the country that bestrides the world like a colossus is without a doubt China.

According to US ResearchandMarket July 2014, the Chinese construction industry recorded a nominal compound annual rate of growth (CAGR) of 19.99% during the period 2009–2013. The infrastructure and residential markets collectively accounted for 72.3% of the total construction industry in 2013.

The construction industry's output is expected to record a CAGR of 9.72% over the forecast period 2014–2018.

In nominal terms, the total construction value add in China reached CNY3.9 trillion (US\$628.7 billion) in 2013. The value add for Chinese construction industry is projected to reach CNY6.1 trillion (US\$942.3 billion) in 2018.

In 2014, China Railways Corp increased its budget from CNY700.0 billion (US\$112.8 billion) in 2013 to CNY720.0 billion (US\$116.0 billion) in 2014. It includes 48 new projects and the opening of 7,000km of new rail lines in 2014. By 2020, China will have 120,000 km of high speed rail lines.

In September 2012, the Chinese government announced a package of infrastructure projects— highways, waterways, rail lines, and waste water treatment plants—worth more than \$150bn.

Major hydropower projects are being undertaken upstream of the world largest hydropower project of 3 Gorges on the Yangtze River. The world biggest water transfer scheme, the North-South Water Transfer Project is on track, so also the longest Zhuhai-Macao-Hong Kong bridge on the sea after the successful completion of the 36 km bridge on the sea at Hangzhou Bay some years ago.



The Three Gorges Project is primarily a Flood Mitigation Project. Disastrous Floods in Yangtze River occurred about once a decade. The 1998 flood was considered the worst flood in 40 years in China . It resulted in 3,704 dead, 15 million homeless and US \$26 billion in economic loss. The Three Gorges Project also provides 22,500 Mw of renewable hydro power, the largest in the world. Total Project Capital Cost US \$22.5 Billion



(World Bank funded Xiaolangde Hydro Project , Yellow River, Louyang, China)

The Yellow River used to be "China's Sorrow" due to severe floods. Due to many dams upstream and over drawdown of its water, it has run dry at the delta in Shandong.

**The South North Water Transfer Project in China** essentially transfers water from the Yangtze to the Yellow **River with 3 Routes.** The total project is expected to cost US **\$62 billion. The Eastern Route** will be 1,155km long and involves the construction of 23 pumping stations. The Central **Route diverts water with route** length totalling some 1,267km in length. The Eastern Route is completed in 2014.

The western route involves working on the Qinghai-Tibet Plateau nearly 500km across the Bayankala Mountains.





### The World's Highest Railway Qinghai Tibet Railway



The 36km-long Hangzhou Bay Bridge is the longest ocean-crossing bridge in the world, spanning across the Hangzhou Bay on the East China Sea connecting Shanghai and Ningbo.



The container pier at Yangshan Port, which forms part of the Port of Shanghai This is the world's busiest trading port which handles 32million containers a year carrying 736million tonnes of goods to the world



China's homemade "Harmony - CRH380A", a new generation of experimental high-speed train, realized the high speed of 416.6 km an hour. This is the world's highest speed in the history of railway.



China is building world's biggest airport in Beijing with nine runways.

The series of slides above vividly illustrate China's tremendous infrastructure development at home and her cutting-edge construction and manufacturing capabilities and capacities.

China also graduates more than one million engineers a year to supply needed skilled human capital for her construction industry.

There cannot be any doubt that China will continue to carry on with infrastructure construction at home and vastly expand her infrastructure construction projects abroad.

Above all else, China has her financial wherewithal as China's foreign exchange reserve in Dec 2014 was US\$ 3,843.0 billion.

By many accounts, China's Top Global Achievement in 2014:

• The Asian Infrastructure Investment Bank (AIIB).

The AIIB will succeed due to:

- Member states share a major common goal: development.
- Developing countries are desperate in need of funding for infrastructure projects.
- China has big home market, manufacturing and technology for infrastructure.
- China has very deep pocket and can demonstrate China's global leadership.
- Through AIIB, China and the South will challenge the unfair global financial order led by the West.

The number of prospective founding nations of AIIB has reached 57 from the initial 21 in October 2014. 37 are from Asia.

AIIB will start with US \$50 billion in capital from China, 50% of initial capital base of US \$ 100.0 billion. I understand no country will hold more than 20% of AIIB capital base. Asian members will hold 75% of the capital and thus the voting rights of AIIB. AIIB will be totally focused on infrastructure projects.

Asia has a massive infrastructure funding gap. Statistics from the Asian Development Bank (ADB) show that between 2010 and 2020, US \$ 8,000 billion will be needed in the Asia-Pacific region to improve its infrastructure. However, the ADB is only able to provide about 10 billion U.S. dollars annually for this.



Prospective Founding Members (PFMs) of AIIB PFM which signed the memorandum to build AIIB Approved as PFM of AIIB Applying to become an ordinary member of AIIB No commitment to participate or rejected Almost simultaneous with the AIIB proposal, China announced the "One Belt One Road" Project. The "Belt and Road" routes run through the continents of Asia, Europe and Africa, connecting the vibrant East Asia economies at one end and developed European economies at the other.

The Silk Road Economic Belt focuses on bringing together China, Central Asia, Russia and Europe, linking China with the Persian Gulf and the Mediterranean Sea through Central Asia and the Indian Ocean.

The Maritime Silk Road is designed to go from China's coast to Europe through the South China Sea and the Indian Ocean in one route, and from China's coast through the South China Sea to the South Pacific in the other. China President Xi said in the BoAo Forum in Hainan China on 28 March 2015: "The Silk Road Economic Belt and the 21st Maritime Silk Road initiative, proposed by China, will push trade and investment between China and countries along the routes and their common development. China pledge US \$40.0 billion for the 'One Belt One Road' initiative. We hope the annual trade volume between China and these countries to surpass 2.5 trillion U.S. dollars in a decade or so." He also announced the release of the "Vision and Actions On Jointly Building Silk Road Economic Belt and 21<sup>st</sup>-**Century Maritime Silk Road'' Document.** 

http://news.xinhuanet.com/english/china/2015-

### <u>03/28/c\_134105858.htm</u>

The action plan has been established on four principles -- openness and cooperation; harmony and inclusiveness; market operation; and mutual benefits, emphasizing policy coordination, connectivity, unimpeded trade, financial integration and people-to- people bonds.

#### One belt, one road

China is pushing to revive its ancient overland and maritime silk routes to Europe. The route connects many land and sea ports over three continents.



ST GRAPHICS ADAPTED FROM REUTERS

The "One Belt One Road" Project is not just an action plan on paper. Important segments are ongoing, In the "One Belt" Project, the 770 km Moscow-Kazan and the Astana-Almay 1000km high speed rail projects are ready to start implementation. The high speed rail project by China in Thailand will herald the 3,000km high-speed line from Kunming, China all the way down to Singapore, passing through Laos, Thailand and Malaysia. This is an important extension of the "One Belt" Project to ASEAN.

In the "One Road" Project, the Chinese has started construction of new Port of Lamu in North Kenya to link landlocked South Sudan and Ethiopia to the Indian Ocean. The project will eventually include a major highway, a railway and an oil pipeline. The Chinese lease and operate part of the Port of Piraeus in Greece. It owns the Port of Gwadar in Pakistan and is linking it through 3000km long highway and rail to Xinjiang in China. The Chinese is building the new container port of Dolareh in Diibouti.

# **CORRIDOR OF OPPORTUNITY**

Prime Minister Nawaz Sharif's vision for a game-changing economic corridor to propup a flagging Pakistani economy, dominate Afghanistan and contain India

#### RELATED/SPIN-OFF PROJECTS TO THE CORRIDOR

Karachi to Lahore motorway The 1,240-km project will be completed by 2005.

Metro bus, anderground metros For Lahore, Gujranwala, Multan, Faisalabad, Rawalpindi, Metro in Karachi.

PROJECTS

Economic City in Owndar To be coupled with the Chinese port to become a free trade zone like Hong Kong or Singapore.

Kazakoczes highway Chita currently upgrading this highway built in 1979.

Kong Kong or Singapore.

161206

RABIAN

### \$18 BILLION

PESH28MAR

KASHGAR

ARROTTARAD

FERE OPTIC

LINK TO KIN

REAL POOL

KASHGAD-CIMADAR ECONOMIC CORRIDOR FEASIBILITY PROJECT TO BE Completed by Next Year. Road, Latur Railway and Or. Pipeline, To Link Xirkiang With Gradar. China is investing **\$46bn in Pakistan**, including an economic corridor linking its western **Xinjiang province** all the way to the south-west port of **Gwadar** on the Arabian sea some 3000 km in length with highway, rail, optic fibre, oil and natural gas pipeline.



The Asian Highway Project is a cooperative project among countries in Asia and Europe and the ESCAP since 1992!

Agreements have been signed by 32 countries to allow the highway to cross the continent and also reach to Europe.

### It is still a plan on paper!

### **Infrastructure in Latin America and the Caribbean (LAC)**

According to World Bank Report, infrastructure is hampering LAC's ability to grow, compete and reduce poverty. Key recommendations:

- LAC needs to spend more on infrastructure. The region is spending less than 2% of GDP on infrastructure but 4 6% per annum is needed.
- It also needs to spend better. A better allocation of resources is needed between investment and maintenance.
- Governments remain at the heart of infrastructure service delivery. Governments still need to regulate infrastructure provision as well as paying for a good share of investments.
- The private sector is needed, but bringing it back requires building on the lessons of the last decade.

http://news.bbc.co.uk/2/hi/business/4197874.stm

LAC comprises Mexico, all Central America, South America and the Caribbean. In 2014, LAC has a combined nominal GDP of US\$ 5,573.00 million.

If annual investment for infrastructure in LAC is raised to 4% of GDP , the amount will be US \$ 223.0 Billion.

If annual investment for infrastructure in LAC is raised to 6% of GDP, the amount will be US \$ 334.0 Billion.

The annual amount is too large to be realised in short term. But the potential for infrastructure construction in LAC is hugh.

Dominant player is China who has pledged US \$250.0 Billion to LAC over ten years.



Chinese Corporation owns 50 year concession that can be extended for another 50 years once the waterway is operational. Construction of the canal, estimated to cost US\$40 to \$50 billion, began in December 2014, with completion due within five years.

### Many Transoceanic Canal Proposals on Paper over Many Years!





China, Brazil and Peru signed an agreement on May 19 2015 for feasibility research on a railway linking Brazil's Atlantic coast to Peru's Pacific coast. Project estimated to cost US\$9.97 billion

The trans-ocean railway will allow Brazil to export goods through the ports of the Pacific Ocean it sells to China, reducing the costs of transportation. Brazil in 2014 exported products worth over US\$51.9 billion to China.

### **Infrastructure in Africa**

The largest potential infrastructure construction market outside China is Africa.

The International Monetary Fund(IMF) high-level Conference <u>"Financing</u> <u>the Future: Infrastructure Development in Central Africa</u>" Cameroon March, 2014 agreed that large infrastructure gaps remain in Africa. It is estimated the financing for infrastructure in Africa is US \$20.0 billion per annum.

http://www.imf.org/external/np/seminars/eng/2014/CMR/fra/index.htm

The amount of US \$ 20.0 billion per annum is small due to the current low infrastructure base in Africa.



The African Union inaugurated its newly built headquarters in the Ethiopian capital, Addis Ababa in January 2011.The entire US \$200m project was funded by China as a gift to the AU. Construction began in January 2009 and involved 1,200 Chinese and Ethiopian workers. China has long been helping Africa with infrastructure development and have completed 1,046 projects, built railways with the total length of 2,233 km and highways with the total length of 3,530 km in Africa.

To support the construction of infrastructure in Africa, China has offered significant preferential and commercial loans. From 2010 to May 2012, China provided preferential loans for 92 projects, worth a total of US \$11.3 billion.

China has pledged US \$100.0 Billion for Infrastructure Projects in Africa.



**Construction and Infrastructure Outlook in Malaysia** 

According to the Malaysian-German Chamber of Commerce and Industry (MGCC/AHK) Report "Market Watch 2012: Construction Industry in Malaysia" :

http://www.malaysia.ahk.de/fileadmin/ahk\_malaysia/Market\_reports/The\_ Construction\_Industry.pdf

"The Malaysian construction industry is generally separated into two areas. One area is general construction, which comprises residential construction, non-residential construction and civil engineering construction. The second area is special trade works, which comprises activities of metal works, electrical works, plumbing, sewerage and sanitary works, refrigeration and air- conditioning works, painting works, carpentry, tiling and flooring works and glass works." Construction is an important part of the Malaysian economy due to the interaction with other industry branches such as the metals processing industry and the mechanical engineering or the tourism sector. In 2011, the construction-related cluster expanded by 14.7% (2010: 18.9%).

In addition, some domestic construction companies were also augmented by overseas projects, especially in the Middle East, India and Thailand. The projects include construction of highways, airport terminals and hydropower plants.

From 2011 to 2015, the Malaysian Construction Sector is expected to grow at 3.7% per annum as compared to 6% per annum GDP growth for the country. In promoting economic growth through Private Sector participation, 52 high-impact projects worth RM63 billion (US \$ 19.0 billion) have been identified for implementation under the Public-Private Partnerships (PPP) initiatives.

Malaysian infrastructure corporations have accumulated valuable project and facility management experience in their infrastructure investments at home and overseas.

Malaysia's construction industry is mature with good design, construction and project management track record. The infrastructure in Malaysia has almost all been home built and largely home financed.

### **Maintenance of Infrastructure**

In all the pronouncements on SDGs, AIIB, "One Belt One Road" Project, and World Bank and other studies on infrastructure construction cited in this paper, little or no mention is made on the need to maintain in good working order of the infrastructure assets that are being built at high capital cost and at high speed throughout the developing world.

China seems to have a fixation about building infrastructure projects overseas below budget and ahead of time. This is perhaps understandable for China to want to establish a track record as the foremost infrastructure construction nation on earth. Their construction corporations tend to import almost everything from home without involving anything local.

This is most evident in Africa where indigenous technical expertise and project management skill are lacking. Except for the most basic labour, everything is Chinese from China. They have not nurtured African engineering and technical expertise, especially in the area of maintenance of built infrastructure.

In June 2014, in my meeting with the Vice President of the Chinese Academy of Engineering in Beijing, I urged CAE to convey to the proper authorities the concern of Africans and suggested using the facilities of the Confucius Institutes in African countries for training of Africans in maintenance of infrastructure. It has frequently been argued that every major construction contract from North to South includes clauses requiring the contractor to transfer technology and train indigenous engineers and technicians in the operation and maintenance of the infrastructure facility being built.

Yet the experience in South countries has been very disappointing as such undertaking has seldom been taken seriously by the contractors from the North and little actual benefit accrues to the South. Infrastructure construction experts like myself are very concerned at the lack of indigenous infrastructure maintenance capacity and capability in the South.

We have been advocating that South countries set aside 10% of the capital cost of an infrastructure project for life long maintenance of the infrastructure assets.

As the annual turnover of world construction is estimated at US\$ 3.1 trillion (3,100 billion), 10% of that total is some US 310.0 billion. Taking the average infrastructure asset life as 25 years, the annual global budget for maintenance of infrastructure would be some US\$ 12.0 billion.

This is a sizable yet neglected market.

### ISTIC

The International Science, Technology and Innovation Centre for South-South Cooperation under the Auspices of UNESCO (ISTIC) is a successful outcome of the 2<sup>nd</sup> Summit of China+G77 in Doha 2005. The Summit urged **UNESCO** to balance initiatives on the supply side of S&T with more initiatives on the demand side for the benefit of peoples in South countries. **UNESCO** approached Malaysia to host ISTIC as a Category II Centre in 2006. UNESCO Category II Centre is funded by the host nation. Malaysian government agreed. ISTIC was formally launched in Kuala Lumpur on 22 May 2008.

All ISTIC programmes have been devoted to institutional and human capital capacity building in science, engineering and technology in the South through South-South cooperation.

### "Maintenance of Infrastructure" is an ISTIC priority agenda.

Since 2009, ISTIC has organized "Maintenance of Infrastructure" workshops in India (3), Kenya, Myanmar, Nigeria and Malaysia (3). ISTIC "Maintenance of Infrastructure' agenda has attracted widespread interest and increasing support in the South.

Closely associated is another ISTIC priority agenda on the accreditation of engineering and technology education qualifications to international standards in Asia and the Pacific. ISTIC's partners are the UNESCO Regional Science Bureau for Asia and the Pacific, Jakarta and the Federation of Engineering Institutions in Asia and the Pacific (FEIAP), Kuala Lumpur. This initiative will eventually lead to the mobility of well qualified engineers and technologists in Asia and the Pacific. The above ISTIC priority programmes related to engineering are geared to SDG No. 4 "Ensure inclusive and equitable quality education and promote life-long learning opportunities for all".

SDG No. 4 places great importance on formal technical and vocational education and training. This is crucial for providing the necessary human capital for infrastructure development and its associated construction and services SMEs.

However SDG No. 4 does not have any target on life long learning. This is where ISTIC priority agenda on the accreditation of engineering and technology education qualifications to international standards in Asia and the Pacific is properly positioned. I urge AAET to be a partner of FEIAP, UNESCO and ISTIC in this programme. HE UNESCO D.G. Irina Bokova Delivering Keynote Address at Opening of ISTIC 5<sup>TH</sup> Anniversary May 2013



### **ISTIC Return Home to UNESCO Paris September 2013**



Another ISTIC Priority Programme for SDG No.4 is Evidence Based Science Education or Science, Technology, Engineering and Mathematics (STEM) Education Programme for Primary and Secondary Schools.

In this, ISTIC's Partners are the Science Education Programme (SEP) of the InterAcademy Partnership (IAP) of 107 National Academies of Sciences. I am the Chair of IAP SEP Global Council and the Academy of Sciences Malaysia is the Lead Academy. Another partner is "La Main a la Pate" of France.

I am very pleased that AAET Malaysia Chapter has been instrumental in the establishment of the annual Kuala Lumpur Engineering Science Fair. I understand you will hear more about KLESF later this evening. Malaysia as a Regional Centre for Infrastructure Maintenance

In my experience, African and other developing countries look to Malaysia as their model for social and economic development.

In recent years, Africa and Latin America have turned their development eye to Asia due mainly to China.

However, China is a superpower. As such, it will be unrealistic for most African and Latin American countries to attempt to emulate China in social and economic development.

The multi-ethnic, multi-religious and multi-cultural Malaysia is a much more achievable model especially for African countries to follow. All African and other South nation professional engineers and policy makers that have visited Malaysia have marveled at the modern, widespread and inclusive infrastructure in Malaysia. They are also impressed at the good repair and maintenance of our infrastructure.

In infrastructure development, they regard Malaysia as a first world nation.

Due to rapid engineering and technological advances, the infrastructure assets are becoming more and more sophisticated, so also the facilities and devices for their maintenance. The ISTIC "Maintenance of Infrastructure" Agenda cannot remain as an event based agenda confining to one or two workshops here and there. It must become a strategic agenda in line with global need as set out in SDGs especially SDG No. 9. I am very encouraged by the support of all Malaysian organisations related to human capital capacity building in the construction industry like the Institution of Engineers Malaysia (IEM), Construction Industry Development Board Malaysia (CIDB), Malaysian Highway Authority (MHA), Master Builders Association Malaysia (MBAM) and Malaysian Service Providers Confederation (MSPC) as partners of the ISTIC Maintenance of Infrastructure agenda.

I have proposed that all the organisations pool their human capital capacity building resources together to establish a regional institute to offer regular structured continuing professional development (CPD) programmes for Malaysian engineers and technicians and counterparts from other South countries particularly those from other ASEAN and Africa countries. I urge AAET to be a proactive partner in ASEAN. At the same time, I have urged Malaysian professional service providers in the field of maintenance of infrastructure to expand their services overseas to set up similar indigenous professional service SMEs in ASEAN and other South countries.

This initiative, if carried out sustainably for medium and long term, will build up a cohort of "alumni of Malaysia" in ASEAN, Africa and elsewhere that will help Malaysia to secure construction projects in South countries.

I would urge AAET Fellows to consider doing the same in their own countries.

The best way for AAET to contribute to the SDGs 2016-2030 will be for AAET to be associated directly with the UN. An opportunity arose in 2014 when the UN Office for South-South Cooperation (UNOSSC) of the UN Sec-Gen invited Malaysia through ISTIC and the Prime Minister's Science Advisor to host the UN South-South Development Expo 2015 in Kuala Lumpur in May 2015. The Kuala Lumpur Engineering Science Fair 2015 would be a major component of UN S-S Development Expo 2015.

AAET became a Partner of the UN S-S Development Expo 2015. AAET President Datuk Hong Lee Pee was a member of the 3-member Malaysian delegation to the UN S-S Development Expo 2014 in Washington DC.

Unfortunately the disastrous flood in early 2015 forced Malaysia to impose austerity and decline the hosting of UN S-S Development Expo 2015.

Dato' Lee Yee Cheong, ISTIC Governing Board Chairman, was honoured with the Triangular Visionary Leadership Award 2014 by the United Nations Office for South-South Cooperation (UNOSSC) at the UN Global South-South Development Expo 2014 on 17 November 2014 in Washington DC. The award was a recognition of his leadership in promoting South-South Cooperation and Triangular Cooperation through ISTIC.





# **THANK YOU**