

Society of Floating Solutions (Singapore)

The Society of Floating Solutions (Singapore) is pleased to present a public education lecture by renowned nuclear engineering Professor Jacopo Buongiorno of the Massachusetts Institute of Technology and Director of the Centre for Advanced Nuclear Energy Systems titled

“Is Nuclear an Attractive Clean Energy Option for Singapore?”

ABSTRACT

With ~60 new reactors under construction worldwide, the nuclear industry is currently experiencing moderate growth, mostly concentrated in Asia. However, a much greater expansion is needed if nuclear is to play a significant role in combating climate change. The challenges hindering further growth of nuclear energy utilization include: (i) the high capital cost (3-5 billion dollars per 1000 MWe of installed capacity) and long lead time (5-7 years) required to build new plants; (ii) the negative perception about safety of nuclear plants in the public and governments of some countries; (iii) the economic and regulatory challenges of developing advanced nuclear technologies; (iv) a scarcity of sites suitable for new nuclear plants (NIMBY syndrome); (v) an inherent inability of nuclear plants to adapt to changes in market conditions (merchant vs. regulated) and/or



=



mode of operation (load follow vs. baseload); and (vi) the concerns about disposal of nuclear spent fuel.

If these challenges are properly addressed, there are major opportunities for nuclear to reduce carbon emissions worldwide and

conquer new markets. MIT has launched a multi-disciplinary study, to assess the prospects for new nuclear technologies, policies, business models, and regulatory governance to accelerate the transition to a lower-carbon global energy system around the world. Here we present a set of preliminary findings from the MIT study that are focused on (a) cost competitiveness of nuclear in various markets with and without carbon constraints, and (b) technology innovations that could substantially reduce the capital cost of new nuclear plants.



We also present the concept of an Offshore Nuclear Plant (ONP) offering the potential of a new, economically attractive model for construction, siting, operations and decommissioning of nuclear plants, which could be particularly suitable for applications to Singapore. ONP would be entirely built on a rig in a shipyard in Singapore, towed to the site, where it would be anchored offshore, within territorial waters, and connected to the grid via underwater power transmission cables, thus minimizing usage of coastal land. The ONP is designed with passive safety systems and an infinite heat sink, requiring no external intervention to maintain core and containment cooling during all postulated casualties, including a prolonged station blackout.



SPEAKER

Jacopo Buongiorno is the TEPCO Professor and Associate Department Head of Nuclear Science and Engineering at the Massachusetts Institute of Technology (MIT), where he teaches a variety of undergraduate and graduate courses in thermo-fluids engineering and nuclear reactor engineering. Jacopo has published over 80 journal articles in the areas of reactor safety and design, two-phase flow and heat transfer, and nanofluid technology. For his research work and his teaching at MIT he won several awards, including, recently, the Ruth and Joel Spira Award (MIT, 2015), and the Landis Young Member Engineering Achievement Award (American Nuclear Society, 2011). He is the Director of the Center for Advanced Nuclear Energy Systems (CANES), which is one of eight Low-Carbon-Energy Centers (LCEC) of the MIT Energy initiative (MITEI), as well as the Director of the MIT study on the Future of Nuclear Energy in a Carbon-Constrained World. Jacopo is a consultant for the nuclear industry in the area of reactor thermal-hydraulics, and a member of the Accrediting Board of the National Academy of Nuclear Training. He is also a member of the Naval Studies Board (National Academies of Sciences, Engineering, and Medicine), a Fellow of the American Nuclear Society (including service on its Special Committee on Fukushima in 2011-2012), a member of the American Society of Mechanical Engineers, and a participant in the Defense Science Study Group (2014-2015).



PLACE/DATE / TIME

Venue: Engineering Auditorium LT 7A, Faculty of Engineering, National University of Singapore¹

Date: Tuesday, 16 January 2018

6.00 pm – 6.30 pm

Registration, Buffet Dinner and Networking

6.30 pm – 8.00 pm

Lecture and Q & A

8.00 pm

Lecture ends

REGISTRATION The event is open to all free of charge. Please register [HERE](#).

CONTACT: Please contact (if necessary): Dr Roland Tan email at rtankh@icloud.com or Tel. +65 97571560; or Mr Charles Lim at milselrahc@gmail.com or Tel +65 91008321

ACKNOWLEDGEMENTS

The Society is immensely grateful to Professor Jacopo Buongiorno and the following organisations for their exemplary civic mindedness:

- ❖ **The HEAD Foundation**
- ❖ **M METAL PTE LTD**
- ❖ **CONTINENTAL STEEL PTE LTD**
- ❖ **GL Engineering & Construction PTE LTD**
- ❖ **A Donor who wishes to remain anonymous**



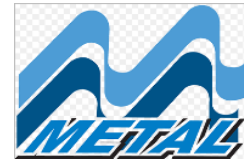
PLATINUM SPONSOR



PLATINUM SPONSOR



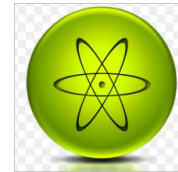
PLATINUM SPONSOR



GOLD SPONSOR



SILVER SPONSOR



SOCIETY OF FLOATING SOLUTIONS (SINGAPORE)

The Society of Floating Solutions (Singapore), is a newly minted society with a mission to respond to the challenges of land scarcity, water shortages, coastal erosion, rising sea levels, food production and sustainable development.

The inaugural council comprises professionals across multi-disciplinary fields that are necessary to deliver robust solutions:

- | | |
|--|---|
| 1. President..... | Mr Lim Soon Heng BE, PE, FIMarEST |
| 2. 1 st Vice President..... | Professor Wang Chien Ming FSEng, FIES, FIStructE ,PhD |
| 3. 2 nd Vice President..... | Dr Sabet Divsholi Bahador PhD |
| 4. Treasurer | Mr Anil Thapar B Naval Arch, MTech |
| 5. Secretary | Mr Charles Lim BE |
| 6. Council Member | Dr Roland Tan Keng Hock BSc, MBA, Hon Doc (Business) |
| 7. Council Member | Asst. Professor Tay Zhi Yung PhD |
| 8. Council Member | Mr Shiben Sandeep Kaul MBA |
| 9. Council Member | Captain James Fong Master Mariner, Extra Master (UK) |
| 10. Council Member | Dr Paul Ong PhD, CMarEng, MICE |
| 11. Council Member | Mr Yap Gwo Chai, Patrick MSc, PMP |

ⁱ Buses Nos: 33, 96, 183 and 188 stop near Engineering Faculty Auditorium. Nearby MRT Stations: Kent Ridge, One North, Clementi, Buona Vista. [Click](#) here for map.