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MORE INCUBATE PARTNERS COME ON BOARD AT CLEANENVIRO SUMMIT SINGAPORE 2018

More opportunities for stakeholders in the environmental services industry to trial technologies, solutions and innovations

Singapore, 9 July 2018 –11 more partners have come on board the INCUBATE partnership, joining the existing seven, and committing to leveraging technologies and innovations to help transform the way environmental services are offered in Singapore. **IN**novating and **CU**rating **B**etter **A**utomation and **T**echnologies for **E**nvironmental Services (INCUBATE) embodies the partnership between the technology providers and services providers, premises owners, and the Government, to collectively innovate and curate better technologies, solutions and innovations for the environmental services industry. The new INCUBATE partners were announced today by Senior Minister of State for the Environment and Water Resources, Dr Amy Khor, at the CleanEnviro Summit Singapore 2018.

2 Mr Ronnie Tay, Chief Executive Officer for the National Environment Agency (NEA), signed Letters of Intent (LOI) with the new INCUBATE partners today, marking the beginning of a series of trials that will be carried out at our partners' premises over the next few years. The signing ceremony was witnessed by Dr Amy Khor, Senior Minister of State for the Environment and Water Resources, and Mr Lee Chuan Seng, Deputy Chairman of the NEA Board of Directors. The list of new partners is appended below (refer to **Annex A** for the list of signatories and quotes by the new partners).

- Institute of Technical Education
- Marina Bay Sands
- Nanyang Polytechnic
- Nanyang Technological University, Singapore
- National University of Singapore
- Ngee Ann Polytechnic
- People's Association
- Republic Polytechnic
- Resorts World Sentosa
- Singapore Institute of Technology
- Singapore Zoological Gardens

3 Speaking at the signing ceremony, Senior Minister of State for the Environment and Water Resources, Dr Amy Khor, said, "The Environmental Services Industry Transformation Map was

launched in December 2017 and the INCUBATE partnership is a flagship initiative that brings together the public and private sectors to prototype, pilot and profile environmental services solutions. We started with seven partners at the launch of the ES ITM last year, and I am pleased to announce that another eleven premises owners have come on board as INCUBATE partners. As a key enabler of the Environmental Services Industry Transformation Map, the INCUBATE partnership will enable ideas and successes to be reproduced and replicated across the industry, and NEA will continue to facilitate regular sharing sessions amongst the partners.” (Refer to Annex B for a photograph of the signatories.)

Projects at INCUBATE sites

4 Since the launch of the Environmental Services Industry Transformation Map (ES ITM), the existing INCUBATE partners have worked on several projects. For example, Changi Airport Group has deployed autonomous scrubbers at Terminal 4, which help to improve the cleaners’ productivity and efficiency. The cleaners are also upskilled in the process to take on higher value-add work, as they are trained to acquire new cross-functional skills such as operating machinery. Similarly, City Developments Limited and NTUC Club have deployed the use of autonomous scrubbers at City Square Mall and Downtown East respectively. NTUC Club has also implemented the Workforce Management SmartWatch, which speeds up the response time for ad-hoc jobs and makes communication, reporting and manpower deployment more efficient.

5 In addition, City Developments Limited will be trialling in-sink grinders used in conjunction with on-site food waste digesters at the Le Grove Serviced Residences – these grinders are installed in kitchen sinks and are connected to an on-site digester, which produces fertiliser and liquid nutrients that can be used for landscaping. If successful, this may allow apartments to easily recycle food waste. The trial will begin in Q4 2018. NTUC Club is also trialling the use of a food waste digester, which increases productivity by streamlining waste collection and reduces cost on disposal fees.

6 NEA has also started to explore project opportunities with the new INCUBATE partners. For example, People’s Association is looking for a suitable two-in-one solution that can perform cleaning functions and security surveillance at the same time for the premises at Heartbeat@Bedok. This solution will enable the premises owner to optimise their resources by channelling manpower to perform other value-added tasks. Ngee Ann Polytechnic is exploring the use of robotics technology for the cleaning and maintenance of building facades and shelters, and Republic Polytechnic is exploring the use of trackable vacuum robots for cleaning of common areas such as lift lobbies. The Institute of Technical Education is also exploring innovations associated with autonomous cleaning devices. NEA looks forward to the various technologies, solutions and innovations that will potentially be trialled within the INCUBATE partners’ premises.

Request for proposal for smart and easy-to-clean toilets

7 In May this year, NEA also launched a request for proposal (RFP) with four INCUBATE partners – Changi Airport Group, City Developments Limited, Marina Bay Sands and Esplanade – for smart and easy-to-clean toilets. The RFP aims to transform toilet cleaning by using technology and automation to help reduce routine and laborious tasks, facilitate a shift of a frequency-based model to an on-demand model, and to improve the work environment of the cleaners in performing their day-to-day tasks. Although there are different types of technologies available in the market

today that aim to improve the productivity of toilet cleaning, the solutions deployed individually have specific functions and have limited impact on the overall effectiveness in improving toilet cleaning productivity. A holistic suite of technologies that cover design planning, operations and maintenance will enable a more efficient and effective way of toilet cleaning, and help to enhance the user experience. The RFP will close on 26 July 2018 at 12 noon. Interested parties can find out more about the RFP on the NEA website: <https://www.nea.gov.sg/programmes-grants/grants-and-awards/request-for-proposal-for-a-smart-easy-to-clean-toilet>.

8 NEA launched the ES ITM in December last year, unveiling the strategies and initiatives to transform the environmental services industry. The collective efforts of all the stakeholders will go towards changing the way environmental services are offered, and ensuring a vibrant, sustainable and professional industry that will provide services and solutions to help achieve our Zero Waste vision and a clean and liveable Singapore.

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About CESS

The biennial CleanEnviro Summit Singapore (CESS) is a global networking platform for thought leaders, senior government officials and policy makers, regulators and industry captains. Held from 8 to 12 July 2018, the fourth edition of CESS is built on the theme 'Transforming Tomorrow's Cities with Clean Environment Solutions', which will deep-dive into five streams: Waste Management, Cleaning, Pest Management, Sustainable Energy and Pollution Control. In-depth discussions and the sharing of best practices will be facilitated through business forums and high level plenaries, such as the Clean Environment Leaders' Summit, Leaders-Experts Forum, Clean Environment Convention, and Clean Environment Regulators Roundtable. The City Solutions Singapore Expo and Innovation Pitch will showcase the latest innovations in environmental technology and solutions.

Organised by the National Environment Agency, Singapore, CESS 2018 is held in conjunction with the Singapore International Water Week and World Cities Summit.

For more information, visit www.cleanenvirosummit.sg.

About the National Environment Agency

Formed on 1 July 2002, the National Environment Agency (NEA) is the leading public organisation responsible for improving and sustaining a clean and green environment in Singapore. The NEA develops and spearheads environmental initiatives and programmes through its partnership with the People, Public and Private sectors. It is committed to motivating every individual to take up environmental ownership and to care for the environment as a way of life.

By protecting Singapore's resources from pollution, maintaining a high level of public health and providing timely meteorological information, the NEA endeavours to ensure sustainable development and a quality living environment for present and future generations.

ANNEX A

List of signatories for INCUBATE signing ceremony

Organisation	Signatory
Institute of Technical Education	Mr Aw York Bin Deputy CEO (Industry)
Marina Bay Sands	Mr Pek Chin Siong Vice President, Hotel Operations
Nanyang Polytechnic	Mr Ang Eng Nam Director, Estates Management
Nanyang Technological University, Singapore	Ms Tan Aik Na Vice President (Administration)
National University of Singapore	Prof Philip Liu Vice President (Research and Technology)
Ngee Ann Polytechnic	Ms Looi Mei Fong Deputy Principal
People's Association	Mr Desmond Tan Chief Executive Director
Republic Polytechnic	Dr Michael Koh Deputy Principal, Academic Services
Resorts World Sentosa	Mr Yim Choong Hing Senior Vice President for Hospitality
Singapore Institute of Technology	Prof Ng Siu Choon Associate Provost (Students)
Singapore Zoological Gardens	Ms Sherri Lim Chief Park Operations and Revenue Officer

Quotes by INCUBATE partners

“With the launch of the Environmental Services Industry Transformation Map in December 2017, about 30,000 individuals in the environmental services industry can benefit from higher value-added jobs through upskilling and technology adoption by companies by 2025. The collective outcome of this transformation in environmental services will have significant impact downstream on all aspects of Singapore's urban lifestyle. It is thus imperative that both the manpower digitalisation and technology for productivity capabilities grow in tandem. With the INCUBATE partnership, ITE can focus on supporting the new emerging skills and test bedding the new machinery.”

Mr Aw York Bin
Deputy CEO (Industry)
Institute of Technical Education (ITE)

“Over the years, Marina Bay Sands has been working closely with the NEA to roll out numerous sustainability initiatives and programmes. The INCUBATE partnership marks the start of our next journey with NEA, and it aligns with our integrated resort's focus on environmentally-friendly and efficient operations. We look forward to working with the agency to develop innovative sustainability solutions at Marina Bay Sands.”

Mr Ian Wilson
Senior Vice President of Non-Gaming Operations and Hotel Operations
Marina Bay Sands

“The INCUBATE partnership is truly relevant and timely as Singapore tackles environmental challenges together as a nation. Nanyang Polytechnic is committed to providing a holistic campus experience, including a consistently clean and hygienic setting.

With the partnership, we will be looking at the implementation of relevant technology such as autonomous floor scrubbers, and robotic cleaners. We are also keen on exploring how to use technology and our engineering know how to create smart washrooms – where toilet paper replacements can be triggered automatically, for instance.”

Mr Ang Eng Nam
Director, Estates Management
Nanyang Polytechnic

“NTU is proud to support Singapore's drive towards becoming a zero waste nation by test-bedding the latest environmental technologies and solutions for the environmental services industry that push the boundaries of sustainability, raise productivity levels and promote a vibrant and greener future. Our partnership with NEA underlines NTU's Smart Campus initiative, which aims to demonstrate how tech-enabled solutions and digital technology can be harnessed to not only help improve everyday lives, but also the sustainable development of our natural and built environment.”

Ms Tan Aik Na
Vice President (Administration)
Nanyang Technological University, Singapore

“The National University of Singapore (NUS) is excited to be part of this national effort to transform Singapore’s environmental services industry to meet future challenges. NUS is a prolific inventor and active user of smart technologies for various applications. Our three campuses, which is home to a vibrant community of over 50,000 students and staff, can serve as an ideal testbed for innovative environmental services solutions. We look forward to working closely with NEA, and interacting with fellow INCUBATE partners and other stakeholders, to spur the development and implementation of novel solutions to address real-world challenges in the environmental services sector in Singapore and beyond.”

**Prof Philip Liu, Vice President (Research and Technology)
National University of Singapore**

“Ngee Ann Polytechnic is constantly exploring opportunities for sustainable development to enable us to move towards a more environmentally-friendly campus. Through the use of technology, we seek to enhance operational efficiency in the maintenance and development of our campus facilities. We look forward to working closely with NEA and other key partners to develop and test new innovations that will further our objective of a sustainable campus.”

**Mr Clarence Ti
Principal
Ngee Ann Polytechnic**

“The People’s Association is delighted to be NEA’s INCUBATE partner in implementing smart and innovative initiatives at the community integrated building, Heartbeat@Bedok. The implementation of technology such as the smart scrubbers, bins and toilet automation system have enhanced our deployment efficiency. It also allows our co-workers to embrace smart robotics and automation. User feedback has been encouraging so far. Moving forth, we are confident of improved productivity and better customer experience with the full implementation later this year.”

**Mr Desmond Tan
Chief Executive Director
People’s Association**

“We are pleased to be a partner in NEA’s INCUBATE programme. As a forward-thinking polytechnic, Republic Polytechnic was conceived and designed as a green campus and is the pioneer Institute of Higher Learning to offer a full-time diploma programme that meets the needs of the environmental services industry. Being a partner in the INCUBATE programme will allow us to benefit from the best practices and the latest innovations in the industry so that we can further enhance our capabilities in this sector. This partnership also signifies our intent to avail our campus to the trial and implementation of technologies, solutions and innovations that will improve environmental sustainability. To this end, I am pleased to share that the RP team has already identified several pilot projects to be implemented on campus as part of this collaboration.”

**Dr Michael Koh
Deputy Principal (Academic Services)
Republic Polytechnic**

“As a lifestyle destination resort which welcomes more than 20 million visitors a year, Resorts World Sentosa is always looking for new, ground-breaking and game-changing ways to elevate our guest experience.

We achieve this by exploring innovative technology and eco-friendly practices, closely guided by our sustainability principles, in providing world-class amenities for guests to enjoy our many attractions, dining and entertainment.

RWS currently uses bio-digester technology for efficient management of food waste and has in place a comprehensive and robust recycling programme across the resort for materials including linen, plastics and paper.

This partnership with NEA and other industry leaders will provide greater opportunities for us to develop more effective solutions to serve our guests better and make a positive impact on the environment.”

Mr Yim Choong Hing
Senior Vice President for Hospitality
Resorts World Sentosa

“As Singapore’s university of applied learning, Singapore Institute of Technology’s (SIT) pedagogy takes students closer to industry challenges which in turn become valuable learning opportunities. Students as well as staff are encouraged to be involved in creating innovative solutions that will benefit not only the industry but the community as well. As such, SIT strongly believes that it has a pivotal role in addressing environmental sustainability challenges. It is very exciting for us to be an INCUBATE partner and explore opportunities in raising operational efficiencies in the cleaning and waste management industries through the use of technological and design thinking capabilities. We hope that our pioneering efforts will help pave the way for more innovations to strengthen the environmental services sector in Singapore.”

Professor Ng Siu Choon
Associate Provost (Students)
Singapore Institute of Technology



Dr Amy Khor, Senior Minister of State for the Environment and Water Resources, and Mr Lee Chuan Seng, Deputy Chairman of the NEA Board of Directors on stage with the signatories