

MEDIA RELEASE

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ENVIRONMENTAL SERVICES INDUSTRY TRANSFORMATION MAP 2025 TO STRENGTHEN INNOVATION, IMPROVE PRODUCTIVITY AND CREATE QUALITY JOBS

Having a skilled and talented workforce forms the foundation of a strong and resilient environmental services industry. We will continue to double our efforts to strengthen corporate capabilities and to build a professional and multi-skilled workforce.

Singapore, 16 January 2023 – Senior Minister of State for Sustainability and the Environment Dr Koh Poh Koon launched the Environmental Services Industry Transformation Map (ES ITM) 2025 today. The Environmental Services ITM 2025, led by National Environment Agency (NEA) in partnership with its tripartite partners and key industry players, focuses on accelerating efforts to strengthen innovation, improve productivity and create quality jobs.

2 The 2025 plans will focus on deepening existing industry transformation efforts to build technology-enabled companies, as well as explore new growth areas and new jobs and skills in environmental sustainability. The aim is to create more than 1,600 Professional, Managerial, Executive and Technical (PMET) jobs by 2025.

3 Held in conjunction with the launch of the ES ITM 2025 was the NEA-Industry Scholarship Awards Ceremony. The NEA-Industry Scholarship programme, a key initiative of the ES ITM, started in 2020 to bring in young talent from ITE and Polytechnics to join ES companies. Today, four scholarships were awarded to deserving individuals, who will take on job roles such as admin executives, operations executives, and management trainees in the ES industry upon their graduation.

ES ITM Initiatives Enabled Industry to Continue Providing Services During the Pandemic

4 Current industry transformation efforts have led to good outcomes for the ES industry. Key initiatives include the development and implementation of the NEA-Industry Scholarship programme, the INCUBATE (Innovating & Curating Better Automation and Technologies for Environmental Services) partnership programme, outcome-based contracting for cleaning services, and various efforts in creation of quality jobs and professionalising the image of the ES industry. (Refer to [Annex A](#) for progress of the ES ITM.)

5 The COVID-19 pandemic further underscored the need for a sustainable and resilient ES industry that is ready to deal with future public health threats. Key programmes and initiatives underway since 2017 have enabled the ES industry to continue providing services during the COVID-19 pandemic through technology adoption and automation of processes, by using robots and machines to supplement manual cleaning and disinfection regimes performed by workers.

ES ITM 2025 will Strengthen Innovation, Improve Productivity and Create Quality Jobs

6 To advance Singapore's green growth agenda, the ES ITM has been refreshed to harness opportunities in environmental sustainability, particularly in material circularity as well as

decarbonised waste management solutions. These developments will propel innovation and technology adoption to improve productivity and moderate manpower demand, as well as spur new quality job opportunities for Singaporeans.

7 The ES industry provides essential services in keeping Singapore clean and liveable. The industry comprises some 1,700 establishments and has a workforce of over 71,000, who are involved in diverse activities from waste collection and treatment, material recovery, to cleaning and disinfection, as well as pest management services. The ES ITM 2025 features four key thrusts for the next bound of industry transformation:

a) Intensify Innovation and Technology Adoption to Improve Productivity and Moderate Manpower Demand

8 The ES industry will be positioned as one that turns national and industry challenges into value creation opportunities through research, development, and innovation via innovation challenge platforms, and pre-position ready ES firms for emerging opportunities in growth areas (locally and internationally) such as robotics and automation, resource recovery, material circularity, and carbon capture from waste treatment.

9 On digitalisation, the ES ITM 2025 will support the development of solutions to enable data-driven ES operations and delivery to improve productivity, operational efficiency, as well as alleviate manpower challenges in the industry. These efforts will accelerate the industry's digital transformation efforts, such as increasing adoption of digital solutions, and identifying and growing digital leaders in the industry.

b) Nurture Promising Firms to Seize New Opportunities and Growth Areas

10 NEA will continue to scale up ready Singapore-based companies with global capabilities to internationalise, through global networking platforms such as the biennial CleanEnviro Summit Singapore (CESG) which is organised by NEA for thought leaders, policy makers and industry captains to converge and co-create sustainability and clean environment solutions.

11 In 2022, the CESG was held from 17 to 21 April 2022 at the Sands Expo and Convention Centre, with the theme "Towards Sustainable and Climate-Resilient Cities". Over 11,000 attendees from 65 countries/regions connected with our ES companies and explored business collaborations.

c) Grow Productive Firms to Enhance Service Delivery, Capacity and Resilience

12 NEA has been driving the adoption of OBC amongst service buyers in the cleaning sector. Efforts include the development and publication of reference guides on OBC and tender evaluation, the development and rollout of OBC training programmes, as well as the provision of 1-to-1 consultancy services for service buyers in drafting outcome-based tenders/contracts.

13 NEA will continue to collaborate closely with stakeholders in the cleaning sector to drive adoption of OBC amongst private service buyers, and work with the Singapore Pest Management Association (SPMA), Waste Management and Recycling Association of Singapore (WMRAS) and other industry stakeholders to develop a set of OBC guidelines for the pest management and waste management sectors.

d) Create Quality Jobs and Improve Job Prospects for Lower-Wage and Senior Workers

14 Having a skilled and talented workforce forms the foundation of a strong and resilient industry. Insights on the upcoming trends and in-demand skills were gathered in 2021 through the Jobs Transformation Map (JTM) for the waste management and cleaning sectors, which was released today. The JTM reviewed the progress of workforce transformation efforts since 2017, the impact of the COVID-19 pandemic on the workforce and mapped out a manpower development

roadmap from 2021 to 2035. (Refer to [Annex B](#) for the JTM on waste management and cleaning sectors.)

15 The key recommendations centred on strengthening upskilling opportunities of the workforce, re-designing and re-branding cleaning and waste management jobs, and these were considered into the ES ITM 2025 plans. NEA will continue to collaborate closely with tripartite partners to strengthen the local talent pipeline by attracting fresh graduates and mid-careerists to seize the new opportunities for growth in environmental sustainability and public health.

16 Job redesign and upskilling will remain cornerstones to enhance job value, especially as jobs evolve with increasing emphasis on automation, digitalisation and sustainability. NEA has also refreshed the Guide on Uniforms for the ES industry to include a new chapter on Personal Protection Equipment (PPE), in view of higher demand in cleaning and disinfection services.¹ NEA will work through industry partners to support these efforts, endeavouring to make the work easier, safer and smarter, and to create multi-skilling opportunities for the ES workforce.

Strong Partnerships Between Stakeholders Will Spur Transformation Efforts

17 “The Environmental Services ITM 2025 aims to create a vibrant, sustainable and professional Environmental Services Industry for Singapore and growing cities”, said Mr Wong Kim Yin, Future Economy Council (FEC) Resource and Environmental Sustainability Cluster Co-Chair.

18 “The Environmental Management Association of Singapore (EMAS) will continue to support industry transformation efforts and encourage cleaning companies to adopt technology, and to train their workers to be multi-skilled. We are glad to be on this journey with NEA and will continue to curate relevant training courses and share best practices such as outcome-based contracting with the companies through different platforms and dialogues,” said Mr Tony Chooi, President of EMAS.

19 “The Waste Management and Recycling Association of Singapore (WMRAS) has played a key role in supporting the development and implementation of the Environmental Services Industry Transformation Map. With the initiatives for companies to further build up capabilities in sustainability and digitalisation, this will tie in well with the introduction of the Progressive Wage Model for the waste management sector this year. While we are prepared for these changes, we look forward to how ES ITM 2025 will help to retain and attract local talent into the sector,” said Ms Melissa Tan, Chairman of WMRAS.

20 “Since the incorporation of the pest management sector in the Environmental Services Industry Transformation Map in April 2019, the Singapore Pest Management Association (SPMA) has been working closely with NEA to ensure that the pest management workforce is well equipped with the necessary skills and knowledge to deal with the public health challenges of tomorrow. With the unveiling of ES ITM 2025, SPMA will continue to be the conduit between NEA and the pest management sector, encouraging the adoption of sustainable pest management solutions through a comprehensive field of knowledge and adoption of innovative technologies (digitalisation, chemistry, equipment and devices), and drive towards quality pest management services,” said Mr Albert Lee, President of SPMA.

21 The ES ITM 2025 will enable us to build operational and manpower resilience in the ES industry, and to create good opportunities for our future generations. NEA will continue to drive efforts with stakeholders and tripartite partners to support the businesses and workforce by maintaining a fair and conducive environment for ES companies to thrive in and developing a responsive training ecosystem that prepares workers for new opportunities.

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¹ Visit NEA’s website for a copy of the Guide on Uniforms: <https://www.nea.gov.sg/industry-transformation-map/guide-on-uniforms-for-environmental-services-industry>

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About the National Environment Agency

The National Environment Agency (NEA) is the leading public organisation responsible for ensuring a clean and sustainable environment for Singapore. Its key roles are to improve and sustain a clean environment, promote sustainability and resource efficiency, maintain high public health standards, provide timely and reliable meteorological information, and encourage a vibrant hawker culture. NEA works closely with its partners and the community to develop and spearhead environmental and public health initiatives and programmes. It is committed to motivating every individual to care for the environment as a way of life, in order to build a liveable and sustainable Singapore for present and future generations.

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Progress of ES ITM

- Launched in December 2017, the ES ITM – which included the cleaning and waste management sectors – comprised strategies and initiatives to drive innovation and widespread technology adoption, upskill the ES workforce to take on better jobs, improve productivity through better procurement practices, and enable ES enterprises to capture value overseas.
- In 2019, the pest management sector was incorporated to reap greater synergy in their business activities and to propel the ES industry forward in the transformation journey.

NEA-Industry Scholarship Programme

- A total of eight NEA-Industry scholars were awarded scholarships when the programme was launched in 2020. Four newly appointed scholars have been awarded scholarships from the second cycle of the NEA-Industry Scholarship.
- Scholars from the first cycle have yet to begin full-time work with the sponsoring organisations – most have either completed or are currently doing their internships. They are being emplaced into various roles, ranging from lab-based work to roles in Human Resources, Quality Environment, Health and Safety.

INCUBATE Programme

- There are 22 INCUBATE partners today, including technology companies to support the ES industry to drive synergistic collaborations between property owners and technology providers within the INCUBATE programme.
- Since the launch of the programme, INCUBATE partners have tested and adopted over 50 productive and novel solutions relevant to their premises (e.g., robotic floor cleaners, smart waste bins and rodent monitoring sensors), enabling an optimisation of manpower needs through job redesign. Some examples include Changi Airport Group, City Developments Limited, CapitaLand, Pan Pacific Hotels Group, People's Association, Downtown East, LandLease, etc.

Outcome-Based Contracting (OBC)

- All government service buyers today are required to adopt OBC when procuring cleaning services through new tenders/quotations. This requirement was put in place since 1 May 2020, and NEA continues to engage private service buyers to promote the adoption of OBC.
- NEA's efforts in guiding service buyers to specify clear deliverable outcomes instead of headcount has enabled service providers to suggest solutions that integrate and better optimise manpower, technology and processes. To date, about 40 per cent of large service buyers have adopted OBC.

Internationalisation

- With government support, more than 35 progressive ES firms have also successfully exported their solutions overseas, capturing value for Singapore. Some examples include:
 - ✓ 800 Super – Successfully clinched the public waste collection contract in Cambodia with the support from EnterpriseSG, Infrastructure Asia and NEA
 - ✓ Plaspulp Union – MOU signed with Borouge, a leading petrochemicals company, to pilot the use of Plaspulp's recyclates in flexible packaging applications
 - ✓ Lionsbot – Range of cleaning robots exported to more than 25 cities globally
 - ✓ Ministry of Clean – Airtumtec Pro, which is a self-disinfecting surface coating product, were exported to Thailand, Hong Kong and Philippines.

Skills Upgrading

- NEA has worked closely with various Institutes of Higher Learning (IHLs) to develop new courses for the ES industry, as follows:

S/N	Course Name	Training Providers
1	Work-Study Programme (WSP) Part-time Diploma in Applied Science (Environmental Services and Management)	Republic Polytechnic
2	Introduction to Digital Technology for Environmental Services	Institute of Technical Education
3	Digitalising Environmental Services 2	Ngee Ann Polytechnic
4	Environmental Infection Control and Management in Non-Healthcare Premises	Ngee Ann Polytechnic
5	Environmental Infection Control and Management in Non-Healthcare Premises	Republic Polytechnic
6	Environmental Infection Control and Management in Non-Healthcare Premises	Singapore Polytechnic

Skills Framework for Environmental Services

- In Dec 2019, NEA, SkillsFuture Singapore (SSG), and in collaboration with Workforce Singapore (WSG) revised the Skills Framework for Environmental Services (SFw) to incorporate the pest management sector. This has provided ES workers greater lateral mobility and more career options across the three subsectors.
 - ✓ For example, a cleaner who obtains the relevant pest management training can take on the role of a pest control worker. ES businesses can now also reap productivity gains and optimise manpower as staff become increasingly cross-deployable.

Job Placement Initiatives

- For mid-career jobseekers who wished to embark on a career in the ES industry, NEA worked with WSG on several Career Conversion Programmes (CCPs) to equip them with the necessary skills and knowledge. These CCPs are reviewed by WSG regularly to ensure relevancy and prepare workers for new emerging roles or needs in the ES industry.
 - ✓ CCP for Environmental Service Specialist; and
 - ✓ CCP for Sustainability Professionals.

Job Redesign and Enhancing Image of ES Workforce

- In tandem with the greater adoption of technology and rising manpower demand, NEA continues to work with industry partners and WSG to drive adoption of scalable job redesign (JR) solutions to support ES enterprises in the transformation of their businesses and workforce.
- Available resources include WSG's 4D JR Framework (self-help) digital guide, 'Redesigning Jobs for the Environmental Services' Masterclass and the ES JR Consultancy Package, which supports enterprises undergoing transformation through the Support for Job Redesign under Productivity Solutions Grant (PSG-JR) for job redesign consultancy, helping them to enhance quality of jobs, to be more productive and attractive for their employees. ES enterprises can also tap on the relevant CCP to reskill in-employment staff to take on the redesigned job role.
- Significant steps are taken towards enhancing and uplifting the image of the ES industry to attract new sources of manpower.
 - ✓ Introduction of industry-wide uniform guidelines to strengthen the professional identity of the ES industry;
 - ✓ Annual ES Workforce Day to celebrate and commemorate the continual commitment and excellence of ES companies and the entire workforce; and
 - ✓ ES Star Awards which are given out to recognise the top exemplary ES employees for their work excellence and contributions in their profession.

Jobs Transformation Map for Waste Management and Cleaning Sectors

To support employers in their job transformation efforts, Workforce Singapore (WSG) has worked with NEA and the industry to develop the Jobs Transformation Map (JTM) for the waste management and cleaning sectors, to provide detailed insights on the impact of technology and automation on the industry and workforce. *(Refer to infographics on page 8 for more information.)*

- It identified the key technologies that are driving change, the impact on individual job roles, as well as pathways and recommendations for employers to transform jobs and for workers to acquire requisite skills, as existing roles evolve, and new job roles emerge.
- The JTM will serve as a useful compass for employers, especially for small and medium-sized enterprises (SMEs), Trade Associations and workers to prepare themselves for the future of work as technology becomes more pervasive.
- The JTM for waste management and cleaning sectors analysed information on manpower profile, skills and training, career and wage progression, and human resource practices of the two sectors, and developed recommendations to accelerate job transformation.
- With this, NEA developed broad strategies to future-proof the workforce, namely developing the local talent pipeline to take on quality jobs, and job redesign. These have been incorporated into the Jobs and Skills strategies of the Environmental Services Industry Transformation Map (ES ITM) 2025.

KEY TRENDS IMPACTING THE ENVIRONMENTAL SERVICES INDUSTRY & WORKFORCE



Accelerated technology adoption

- Improved operational efficiency through adoption of technology



Increase in service demand

- To meet new business needs and higher customer expectations
- More interest in sustainability and stricter hygiene standards



Increased competition for talents

- To cultivate an innovative and manpower-lean workforce



IMPACTED JOB ROLES IN THE ENVIRONMENTAL SERVICES INDUSTRY

General Cleaner and Waste Collection Crew



Key job scope

- Increase use of digital tools, robotics and automation
- Increase communication with customer, including troubleshooting operational issues

Skill sets required

- Communication
- Problem Solving
- Robotics and Automation
- Internet of Things

Waste Recycling Sorter



Key job scope

- Increase use of digital tools, robotics and automation

Skill sets required

- Communication
- Problem Solving
- Robotics and Automation
- Internet of Things

EMERGING JOB ROLES IN THE ENVIRONMENTAL SERVICES INDUSTRY

Integrated Facilities Management Specialist



Key job scope

- Responsible for managing environmental services contracts, projects, and delivering high-quality services in the areas of Cleaning, Waste Management and Pest Management
- Complies with all required workplace requirements and safety guidelines

Skill sets required

- Contract Management
- Facilities Management
- Stakeholder Management

EMERGING JOB ROLES IN THE ENVIRONMENTAL SERVICES INDUSTRY

Data Analyst



Key job scope

- Analyse and consolidate data and create data sets to support sound decision making
- Understand drivers, impacts on key influences on business dynamics and productivity
- Translate data into actionable insights for the stakeholders

Skill sets required

- Data Cleaning and Preparation
- Data Analysis and Exploration
- Statistical Knowledge
- Creating Data Visualisations

EMERGING JOB ROLES IN THE ENVIRONMENTAL SERVICES INDUSTRY

Sustainability Specialist



Key job scope

- Monitoring and evaluating the effectiveness of sustainability programs, and when needed, recommending changes to close strategic gaps
- Assist with the creation and development of an organisation's short- and long-term sustainability strategies

Skill sets required

- Sustainability Reporting
- Environmental Sustainability Management
- Environmental Management Systems

FUTURE-PROOFING THE ENVIRONMENTAL SERVICES WORKFORCE



Develop Local Talent Pipeline to Take on Quality Jobs

- NEA Industry Scholarship



Reskilling and Facilitating Mid-Career Conversions

- Career Conversion Programme (CCP) for Environmental Services Specialist
- CCP for Sustainability Professionals
- CCP for Professional Executives



Job Redesign

- 4D Job Redesign Framework Digital Self-help Guide
- 'Redesigning Jobs for the Environmental Services Industry' Masterclass
- Environmental Services Job Redesign Consultancy Package