

# MEDIA FACTSHEET

ANNEX F

## Funding Schemes

1 To encourage greater use of technology and automation to increase the overall productivity, funding support is available. Various funding schemes facilitate the development and deployment of innovative and smart technologies. The government will also be introducing various funding schemes that are open to researchers and industry players to encourage greater use of technology and automation to improve productivity.

### ***Research Funding Initiative – Closing the Waste Loop***

2 NEA will start a new *Closing the Waste Loop* (CTWL) research funding initiative to boost Singapore's research and development (R&D) capabilities in developing solutions to extract value and resources from key waste and residue streams including plastics, food, electrical and electronic products, and incineration ash. By converting waste to resources and keeping the recovered materials in the economic cycle, NEA seeks to enhance our resource efficiency, reduce dependency on incineration and landfilling while at the same time, help to maintain high levels of public health. The initiative is supported by the National Research Foundation (NRF) and the Ministry of National Development (MND) under the Research, Innovation and Enterprise 2020 Plan (RIE2020), with a funding of S\$45 million under the <sup>1</sup>Urban Solutions and Sustainability (USS) domain.

3 The objectives of the initiative are illustrated in Figure 1.

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<sup>1</sup> Urban Solutions and Sustainability(USS) is part of the Research, Innovation and Enterprise 2020 plan to develop a knowledge-based innovation driven economy and society. Specifically, the USS aims to enhance our living environment and address our resource constraints through an interdisciplinary approach.

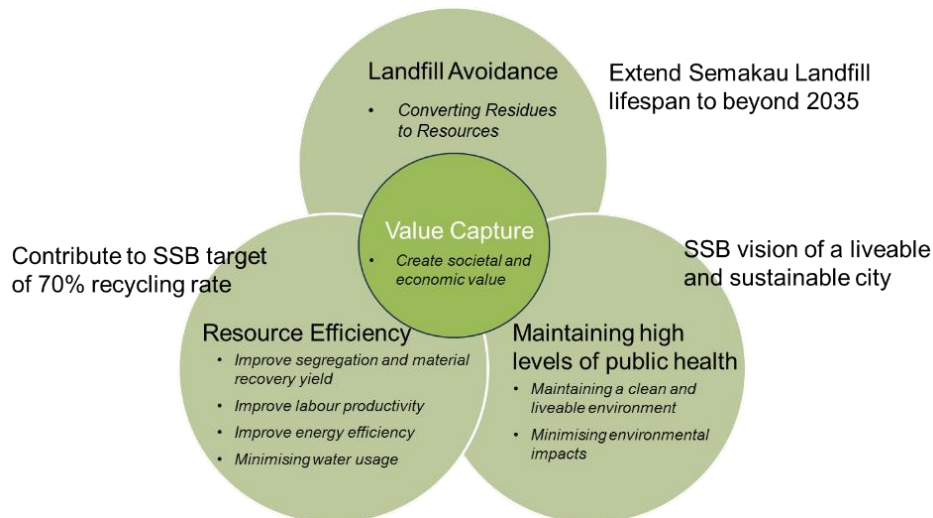


Figure 1: Overarching Objectives of the CTWL Initiative

4 Aimed at tackling challenges posed by increasing waste generation, scarcity of resources and land constraint for waste management, the initiative will focus on four thematic areas, namely: (1) segregation and value recovery; (2) landfill conservation; (3) environmental remediation; and (4) digital and data-driven management systems. These proposed themes will complement the existing Waste-to-Energy (WtE) Programme that NEA is leading under the USS Energy sub-domain to enhance energy recovery from waste. The research focus areas for each theme are broadly summarised in Table 1.

Theme 1: Segregation and Value Recovery	Theme 2: Landfill Conservation	Theme 3: Environmental Remediation
<ul style="list-style-type: none"> <li>• <sup>2</sup>Hydrometallurgy methods for e-waste recycling</li> <li>• Sustainable and <sup>3</sup>bio-benign plastic packaging materials</li> <li>• Food waste conversion to energy and nutrients</li> </ul>	<ul style="list-style-type: none"> <li>• Cost-effective &amp; energy efficient treatment processes for <sup>4</sup>incineration bottom ash, <sup>5</sup>incineration fly ash and <sup>6</sup>non-incinerable waste</li> <li>• Treatment for recycling of industrial residues</li> </ul>	<ul style="list-style-type: none"> <li>• Rapid site investigation and assessment methods</li> <li>• Cost-effective remediation technologies</li> <li>• On-site treatment of soil and residues</li> </ul>

<sup>2</sup> Hydrometallurgy is the use of aqueous chemistry to extract and obtain metals.

<sup>3</sup> Bio-benign plastic packing materials are synthetic barrier materials that prevent the degradation of the protected materials and pose no harm to health or the environment.

<sup>4</sup> Incineration Bottom Ash is the residue ash formed from the incineration of domestic and general waste and discharged from the moving grates of incinerators.

<sup>5</sup> Incineration Fly Ash is the residue ash formed from the incineration of domestic and general waste and deposited from particles carried by the flue gas.

<sup>6</sup> Non-incinerable waste is waste that is not suitable for treatment at an incineration plant and generated from treatment of non-domestic/industrial waste.

	<ul style="list-style-type: none"> <li>• Novel applications for incineration bottom ash and residues</li> </ul>	
<b>Theme 4: Digital and Data-Driven Management System</b>		
<ul style="list-style-type: none"> <li>• Analysis of waste generation and management in the whole value chain</li> <li>• Modelling and simulation to inform on planning and policy decisions</li> <li>• Influence human behaviour through behavioural science</li> </ul>		

Table 1: Closing the Waste Loop R&D Initiative

**Research Funding Initiative – Environmental Robotics**

5 NEA has developed a S\$10.8 million Environmental Robotics Programme, with support from the National Robotics R&D Programme, for the development of robotics solution to:

- a) Enable productivity gains. Through the research, development, demonstration and deployment of robotic solutions, NEA seeks to reduce both NEA’s and NEA contractors’ manpower requirements for current-day operations as well as for future operations in an increasingly urbanised environment.
- b) Enable sustainable manpower stream. The use of robotic technology can transform current manual tasks that are traditionally lower-skilled, lower paying and strenuous, into jobs that are higher-skilled, more productive and better-paying. This would make such jobs more accessible and attractive to a wider demographic base, including locals.
- c) Enhance current capabilities and enable new ones. The use of robotic technology will improve the safety and effectiveness of NEA officers and enable them to better access confined and dangerous areas to carry out inspection, monitoring and sampling tasks.

6 In the initial phase, the Environmental Robotics Programme, will develop robotics solutions for NEA’s work areas in:

- i. Cleaning of Public Spaces;
- ii. Waste Management (Collection, Transportation, Sorting and Disposal);
- iii. Inspection, Monitoring and Sampling for Pest and Pollution Control

7 This programme seeks to catalyse the local robotics industry, providing opportunities for small and medium enterprises, institutes of higher learning, and research institutes to build up expertise and experience in delivering environmental robotic solutions which can be commercialised and exported. The funding would be awarded through open and competitive mode. As part of this initiative, NEA, together with the Ministry of Transport (MOT), had issued a Request for Information (RFI) for the design, development and trial of autonomous road sweepers, pavement sweepers and refuse collection in October 2016. The information collected from this RFI is being used to facilitate preparations for a subsequent Request for Proposal (RFP) through this programme.

## Existing Funding Programmes

8 NEA will also continue to work closely with our partners, such as Economic Development Board (EDB), Employment and Employability Institute (e2i), Info-Communications Media Development Authority of Singapore (IMDA), SPRING Singapore and Workforce Singapore (WSG) to support the environmental services industry in developing and adopting innovative technologies. The government will also continue to explore ways to provide the necessary support for cleaning and waste management businesses to allow them to build capabilities.

Agency	Funding Schemes/ Programmes
EDB	<ul style="list-style-type: none"> <li>Eligible businesses with plans to upgrade capabilities or to grow through conducting high value and substantive activities in Singapore may apply for incentives such as the Research Incentive Scheme for Companies (RISC), administered by EDB which encourages the development of research and development capabilities and technologies through the support of projects in the areas of science and technology.</li> </ul>
e2i	<ul style="list-style-type: none"> <li>The Inclusive Growth Programme (IGP) is a fund managed by e2i that helps companies kick-start productivity projects, with companies in return sharing the productivity gains with their workers through higher wages. e2i helps businesses identify potential areas for improvements to benefit both businesses and workers, and offers grant support under IGP to help companies get started on the productivity initiatives. For more information, visit: <a href="http://www.e2i.com.sg/IGP">www.e2i.com.sg/IGP</a>. NEA has worked with e2i to develop a “common cleaning equipment” list to help companies identify cleaning and waste management equipment that can achieve improvements in work process efficiency. Some of the equipment includes scrubbers, mechanical sweepers, high pressure jets, balers, mobile or static refuse compactors, and on-site food waste processors. This has shortened the time taken for companies to source for equipment and verify the potential productivity improvement before applying for the IGP fund. To request for the latest list, please email <a href="mailto:sitizubaidah@e2i.com.sg">sitizubaidah@e2i.com.sg</a>.</li> </ul>
IMDA	<ul style="list-style-type: none"> <li>The SMEs Go Digital programme by IMDA is designed to provide more structured and inclusive support to SMEs in the use of digital technology to boost their productivity and enhance their digital capabilities in areas such as cybersecurity, data protection and data analytics. IMDA will develop sector-specific Industry Digital Plans to provide SMEs with step-by-step advice to SMEs on the use of digital technology at different stages of their growth and pre-approve digital solutions for mass deployment to benefit SMEs in the sector. IMDA will also support pioneering SMEs piloting emerging digital technologies and helping to show the way to their peers in their sectors. SMEs can seek in-person digital technology consultancy by the Business Advisors at the SME Centres, who will refer</li> </ul>

	<p>SMEs who need specialist advice to the Principal Consultants at the SME Digital Tech Hub. For more information, visit: <a href="http://www.imda.gov.sg/SMEsGoDigital">www.imda.gov.sg/SMEsGoDigital</a>.</p>
<p>SPRING Singapore</p>	<ul style="list-style-type: none"> <li>• The Capability Development Grant (CDG) scheme supports SMEs to build business capability and ensure business sustainability. Companies can undertake projects in areas such as product development, human capital development, productivity improvements and business model transformation.</li> <li>• Companies can also tap on the Automation Support Package (ASP) to scale up the deployment of automation solutions across existing operations.</li> <li>• Under the Gov-PACT (Partnerships for Capability Transformation) programme, NEA is one of the participating government agencies to work with the SMEs/startups to develop and test-bed innovative solutions. Participating companies will go through different stages of product development, from the ideation stage to pilot runs, with the support of the lead demand agency.</li> </ul>
<p>WSG</p>	<ul style="list-style-type: none"> <li>• WSG's WorkPro programme encourages and supports companies' implementation of progressive employment practices that would benefit Singaporeans through job redesign, age management practices and flexible work arrangements. Under WorkPro, funding is provided through the Job Redesign Grant to help companies redesign jobs to make them physically easier, safer and smarter jobs for older workers (i.e. aged 50 years and above). Cleaning and waste management companies could tap on this scheme by adopting technological solutions that support the implementation of redesign workplaces and processes. Companies that have embarked on e2i's Inclusive Growth Programme or SPRING's Capability Development Grant schemes can enjoy additional funding support through WorkPro's Job Redesign (Rider), if the project also leads to a positive impact on older workers. Companies can contact WorkPro's appointed Programme partners - National Trade Unions Congress (NTUC) and Singapore National Employers Federation (SNEF), to apply.</li> </ul>

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