

RIE2025 Press Conference on 11 Dec 2020

Opening Remarks by Mr Heng Swee Keat, DPM and Chairman of NRF

Opening

1. Thank you for joining us this afternoon at the press conference for RIE2025, which sets out our Research, Innovation and Enterprise plans for the next five years, from 2021 to 2025.

- a. We have a Research, Innovation and Enterprise Council, comprising leaders in top academic institutions as well as research bodies and companies from around the world. They advise us on our direction for national R&D efforts.
- b. At the virtual meeting with the RIE Council yesterday, chaired by PM, we firmed up our RIE2025 plan.

Progress Made

2. Our R&D journey started 30 years ago, with our first technology plan in 1991. Over three decades, we have built up a vibrant research and innovation ecosystem.

- a. In research, our Institutes of Higher Learning, A*STAR and academic medical centres have gained in global standing. We have created peaks of excellence in research – in membrane technologies for water, in eye research, in quantum technologies, 2D materials and trust technologies, just to cite a few.
- b. Singapore is increasingly recognised as a global innovation node.
 - i. The Global Innovation Index has ranked Singapore as the world's 8th most-innovative economy in the world, and top in Asia for the past 7 years.

- ii. We have a vibrant start-up ecosystem. Last year, there were nearly 600 venture capital deals worth more than S\$10B, a near 30-fold increase in value from just 10 years ago.
 - iii. Through the Global Innovation Alliance (GIA) initiative, we are well-connected to 15 other innovation nodes in the region and the world.
 - c. Our companies, researchers and the public sector work closely together to develop new values, and innovative products and solutions.
 - i. Local companies continue to join technology consortia and establish joint labs with our IHLs and A*STAR to develop new solutions.
 - ii. For example, Durapower is working with NTU and A*STAR to develop next-generation sustainability energy storage technologies to power future power grids and electric vehicles.
 - iii. Singapore also continues to attract global industry leaders here to deepen their innovation capabilities and invest in our workforce – including Twitter, Tencent, and Zoom – despite the uncertainties of COVID-19.
 - d. Research has not only created new value for our economy, but has also informed better policy. A good example is the research programme on “Growing Up In Singapore Towards Healthy Outcomes” (or GUSTO).
 - i. GUSTO is a study to understand how conditions in pregnancy and early childhood influence the health and development of women and their children.

- ii. One of their important findings was on gestational diabetes and its impact on children's development and long-term health.
 - iii. This led the Ministry of Health to change its guidelines to recommend gestational diabetes screening for all expecting mothers, so that timely intervention can be made.
- 3. When COVID-19 struck, our R&D capabilities in biomedical sciences and infectious diseases enabled us to respond to the pandemic quickly.
 - a. Singapore is the third country, outside of China, to successfully culture the virus. We developed several diagnostic test-kits.
 - i. This includes the Fortitude test kits developed by A*STAR and Tan Tock Seng Hospital, which is now used in more than 45 countries.
 - ii. The other is cPass, the world's first serology test for neutralising antibodies to be given emergency use authorisation by the FDA.
 - b. In vaccine development, a Duke-NUS team is partnering an American biotech company to develop the LUNAR-COV19 vaccine, which is expected to begin late-stage clinical trials soon.

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4. The COVID-19 pandemic has accelerated technological trends and structural changes that will reshape the global economy, and throw up new challenges for societies. For instance, the global pace of digitalisation has accelerated, and greater value has been placed on resilience and sustainability.

5. Science, technology and innovation will be critical to overcome COVID-19, and in enabling us to emerge stronger.

- a. So while we have achieved much since 1991, we must stay the course and sustain our investments, despite economic cycles.
 - b. **Singapore is committed to invest about 1% of our GDP in research, innovation and enterprise each year, for the next five years.**
 - c. This is similar to our commitment to RIE2020 and our earlier research plans.
 - d. In dollar terms, we are allocating a total of S\$25 billion for the RIE2025 Plan, for the period of 2021 to 2025.
6. Let me now highlight three focus areas in relation to RIE2025.
- a. First, we will reaffirm our commitment to basic research, to continually generate a broad base of scientific capabilities that we can draw on.
 - b. Second, we will expand the scope of RIE to better drive economic growth post-pandemic and address our national needs.
 - c. Third, we will scale up technology translation and strengthen enterprise innovation capabilities.
 - d. Let me now elaborate on each of these areas.

(I) Commitment to Basic Research

7. First, sustaining our commitment to basic research.
- a. Our consistent investments in basic research have allowed Singapore to develop a base of scientific capabilities and intellectual property that we can now draw on.

- i. One example is the Centre for Quantum Technologies (CQT) in NUS. This is a world-class research centre that has generated several spin-offs, such as SpeQtral, which designs space-based quantum communication systems.
 - ii. CQT is also partnering companies such as ST Engineering to develop next-generation network encryption solutions, powered by quantum key distribution technologies.
- b. **We will therefore commit one-third of the overall RIE budget to basic research, for RIE2025 and beyond.**
- c. We have also been able to attract and retain a critical mass of top scientific talent to work on challenging research problems. The salience of basic research outputs might not be immediately obvious, but they form the foundations of downstream breakthroughs.
 - i. One example is Prof Wang Linfa at Duke-NUS. His work on bat-borne viruses for over 20 years laid the foundation for the cPass serology test for COVID-19.
- d. We will continue to grow the next generation of scientist and researchers, by strengthening our portfolio of research grants, fellowships and investigatorships. In doing so, we aim to nurture a robust base of research scientists and engineers, and further strengthen links to the global community.

(II) Expand the Scope of RIE to tackle a Broader Spectrum of National Needs

8. Second, expanding the scope of RIE. In RIE2020, we organised our efforts around four domains to focus our efforts in core areas such as manufacturing and healthcare. However, as science and technology become more pervasive, we must

refresh our domains to better drive economic growth post-COVID and address the broader spectrum of national needs.

- a. First, we will expand the “Health and Biomedical Sciences” domain into “Human Health and Potential”.
 - i. The pandemic has illustrated the importance of developing a deeper understanding of and the threats to human health. We have made good progress in our Health and Biomedical Sciences efforts, and will continue to invest in this area.
 - ii. But we are also facing a rapidly ageing population and low birth rate. We must continue to enable our people to enjoy good health, and to realise their full potential. So we will enlarge this domain to include “Human Potential”.
 - iii. Our schools and IHLs have done well to develop our young. We are investing more in pre-schools. To bring out the best in every child, we will embark on more research to improve prenatal and early childhood development, and learning outcomes in schools and IHLs.
 - iv. Beyond school, lifelong learning is just as critical. Just as we strive to make Every School a Good School, we must strive to enable Every Singaporean to be a Lifelong Learner, at every stage of life. So we will invest in the sciences of learning, to enable every Singaporean to fulfil his or her potential.
 - v. At the same time, as our people age, we must strive to enable everyone to stay healthy and remain active. We will increase our investment in research projects relating to the health and well-being of seniors.

- b. Second, within the “Urban Solutions and Sustainability” domain, we will seek to better integrate these two areas better. At the same time, we will pursue sustainability in a broader way.
 - i. We have, since independence, overcome our land constraint through long-term planning and we must continue to transform and improve on our built environment.
 - ii. On sustainability, we are taking climate change seriously. We are committed to reducing our carbon footprint to fulfil our pledge made under the Paris Accord, and protect ourselves from rising sea-level.
 - iii. We will also strengthen our food resilience and preserve our biodiversity despite our dense urban environment.
 - iv. These are long-term challenges, which we must commit our R&D efforts to.

- c. Third, we will expand the “Advanced Manufacturing and Engineering” domain into “Manufacturing, Trade and Connectivity”.
 - i. With Industry 4.0, the advancement of robotics, additive manufacturing and the Internet of Things will reshape the manufacturing landscape. We will continue to invest in advanced manufacturing and to make production more sustainable.
 - ii. Global supply chains are also evolving, and there will be a greater emphasis on resilience and connectivity post-COVID. Connectivity across borders will become even more important. Hence, we must better leverage technology and innovation to strengthen Singapore’s air and maritime connectivity to the world, and to strengthen the resilience of supply chains.

- d. Fourth, we will continue to grow the “Services and Digital Economy” domain, and broaden this to “Smart Nation and Digital Economy”.
 - i. COVID-19 has accelerated the pace of digital change across all aspects of our lives.
 - ii. Digital technology will continue to make advances, and its adoption will be more pervasive – across the economy, social and government sectors.
 - iii. The digital domain is both a horizontal that supports other sectors of the economy, as well as a vertical that we must build deeper capabilities, in areas such as quantum computing and data sciences.
 - iv. We must continue to maximize the value created by digital innovation, and better integrate technology and governance.

9. My fellow colleagues on the panel will further elaborate on these domains later.

10. At the same time, we are working to ensure that there is good synergy between the work in each RIE domain and our economic transformation efforts under the Future Economy Council.

11. Given the rising speed of change, and our evolving needs, our RIE 2025 plan will set aside 15% of the total RIE budget, or S\$3.75B, as White Space. This will give us greater agility and nimbleness in responding to emerging priorities, new breakthroughs and changes in the global and technological landscape.

(III) Strengthen Technology Translation and Enterprise Innovation Capabilities

12. The third highlight is on strengthening technology translation and enterprise innovation capabilities.

- a. Technology and innovation have created tremendous opportunities for businesses which are able to master them, but has exposed those that are not able to keep pace to sharper competition and disruption.
- b. Compared to MNCs, many local enterprises are in the early stages of their innovation journey. They have less experience in working with the research community, and are less able to translate research innovations into new products, services and solutions for the market.
- c. In developing the RIE2025 plan, I met a number of our industry leaders. One common challenge is the ability to identify new technologies that will be relevant to their industries, and finding the right people to apply them to develop new business solutions.

13. In RIE2025, we will strengthen our support for companies and establish new technology translation platforms to support their innovation journey.

- a. Under RIE2020, we embarked on several initiatives to support our enterprises in harnessing science and technology. For example, A*STAR's Advanced Remanufacturing and Technology Centre (or ARTC), has over 80 member companies, and they have been supporting them with the adoption of technological capabilities such as robotics, advanced remanufacturing, and supply chain digitalisation.
- b. We also established platforms such as the National Additive Manufacturing Innovation Cluster, or NAMIC, and A*STAR's Diagnostics Development (DxD) Hub, which accelerated the development of medical diagnostics.
- c. Both platforms contributed to the fight against COVID-19. NAMIC rallied the 3D-printing community to produce medical equipment and

test swabs. DxD Hub sped up the development and production of the Fortitude test kits.

- d. Over the next five years, we will expand existing platforms into adjacent areas with high growth potential. For example, DxD will expand from supporting diagnostics development to Medtech.
- e. In addition, we will also establish new platforms, including one to deploy robotics in the built environment sector.

14. We will also customise our support for different enterprise segments.

- a. For start-ups, we will continue to support them via Start-up SG initiatives and through ecosystem partnerships.
- b. For SMEs, we will develop capabilities to build and introduce new products by scaling up the Innovation Advisors Program.
 - i. We are launching a new Innovation and Enterprise Fellowship programme, to grow the talent pool with skills in technology commercialisation.
 - ii. We are developing ready digital solutions, such as in 5G and trust technologies, that our SMEs can adopt in their digitalisation journeys.

Closing

15. Let me conclude. The COVID-19 pandemic has thrown the world a curveball, but it has also offered a model of how we can work together and leverage science and innovation to overcome our common challenges.

16. Singapore recognises that R&D is a global endeavour, and we must continue to build international partnerships. We have a good start. For example:

- a. In ageing, where we collaborate with countries such as the US, China, Japan, UK and several EU members in the Healthy Longevity Global Grand Challenge; and
- b. Sustainability-related initiatives such as Cooling Singapore, to ensure that our highly built-up environment remains liveable and to reduce the urban heat island effect. This is a CREATE initiative where our local researchers partner scientists from ETH Zurich in Switzerland, MIT in the US, and the Technical University of Munich (TUM) in Germany.
- c. These international efforts enable us to magnify the impact of our RIE investments, which may be a significant sum for Singapore, but is small by international standards. We must leverage on these international partnerships to maximise impact of our work.

17. I have just set out our plans for the next five years under RIE2025. The investments are significant and underscore Singapore's commitment to investing in research, innovation and enterprise. I am confident that these will drive economic recovery and growth, and address our broader national needs. RIE2025 will also strengthen Singapore's vision of being a Global-Asia node in technology, innovation and enterprise.

18. By working together to realise RIE2025, we can emerge stronger from this crisis and create more and better opportunities for our businesses and workers.

19. Thank you.