EMBARGOED UNTIL 15 OCTOBER, 10.00AM

OPENING SPEECH BY DEPUTY PRIME MINISTER AND CHAIRMAN OF THE NATIONAL RESEARCH FOUNDATION HENG SWEE KEAT AT RIE INDUSTRY DAY 2021 AT MARINA BAY SANDS ON 15 OCTOBER 2021

Industry partners,

1. A very good morning, and a warm welcome to RIE Industry Day 2021.

The Flywheel of Innovation

2. Singapore today is a global innovation node. This journey started thirty years ago, when we launched the first five-year National Technology Plan, to move towards an innovation-driven, knowledge-based economy.

   a. Over the decades, the Government has sustained our investments in R&D. Business expenditure on R&D has also risen steadily. With these sustained efforts, Singapore is now consistently rated as one of the most innovative places in the world.

3. Even as we have grown as an innovation node, so too have many other parts of the world, where innovation intensity is accelerating rapidly.

   a. I agree with Song Hwee that technology-enabled inflexions are disrupting industries faster than ever. To continue to thrive in a much more complex and volatile world, we must intensify our commitment to research and innovation.

   b. Over the next five years, as part of our RIE 2025 plan, we have committed $25 billion to research, innovation, and enterprise. Our aim is to develop Singapore as a Global-Asia node of technology, innovation and enterprise, building on our strategic position in Asia, and our long-standing collaboration with the global community.

   c. Our investment in RIE 2025 is significant, relative to our resources and to our GDP. But this is a small fraction of what the whole world is investing. To achieve impact, we must make every dollar count, and multiply its impact with our global partners.

4. At RIE Industry Day in 2019, I spoke about how innovation requires collaboration.

   a. That remains true today. We must operate as a system, not as a loose collection of individual gears. So I am glad that we continue to build on what we have started, to bring together different parts of our research and innovation eco-system.

   b. Despite the many urgent demands posed by COVID-19, more than 350 of you – from our companies, IHLs, research institutions and government agencies have set aside time for today's event.

   c. I thank Boon Heng, Dilhan, Song Hwee and the Temasek team for your leadership, working together with NRF and A*STAR to put this event together.

5. RIE Industry Day is an important occasion to power the flywheel of innovation.

   a. As the flywheel metaphor implies, the initial turns are the hardest. But if we persist, we can build up the momentum to achieve a virtuous innovation circle, where initial success provides greater impetus for the next round of success.

   b. Temasek has put together a thoughtful programme, and I hope that this will spark off even more exchanges and collaboration beyond today.

6. The role of Industry Day is not only to power the flywheel of innovation, but to also help the system shift gears. How can we do so?

   a. First, we must connect more gears in the machinery to the flywheel, by making innovation much more pervasive.

   b. Second, we must maximise the flywheel loop, by innovating in areas where we can make the most impact, which will in turn spur greater innovation.

c. Third, we must build up the flywheel angular momentum, to power the changes that require long gestation and patient capital.

d. I will cover each in turn.

Making Innovation More Pervasive

7. The first shift is to make innovation more pervasive.

a. We have built up a thriving start-up eco-system. While relatively nascent, we have nurtured a number of unicorns, including Grab, Sea, Lazada, and Razer.

b. Start-ups are prominent in any innovation eco-system, as they push the frontiers of possibilities. But we must remember that in all economies, large and medium enterprises anchor a big part of the economy – in Singapore's case, more than 85%.

c. For the Singapore economy to stay competitive, we must have a vibrant eco-system, with innovation permeating all companies. I am glad to see business leaders of large and medium companies here with us today.

8. There is a view that larger companies – with a large asset base, steady revenue, and established systems – are less innovative. Indeed, the pressure to change may be less acute in the short term. But failure to innovate can be very costly in the long term.

a. Increasingly, larger corporates are exploring the best ways to leverage on their size. Larger corporates often have advantages that start-ups do not have – access to customers, established supply chains, production facilities and distribution channels, and a strong base of IP and know-how.

b. Globally, corporate venturing activity has risen steadily over the years. Larger companies are finding opportunities in creating globally competitive new ventures, especially in a more complex world.

c. In Singapore, companies such as ST Engineering, Singtel and Advanced MedTech, have set up dedicated corporate venturing arms. Through the Corporate Venture Launchpad by EDB, we have also built up an eco-system of venture studios that are helping corporates which are new to the venturing process. Over the past few years, more than 40 corporate ventures have been created.

d. One of them is Jiva, a corporate venture by Olam in collaboration with BCG Digital Ventures. Jiva is a farmer services platform, which empowers smallholder farmers to increase crop yields, get access to credit, and sell their products. Smallholder farmers are among the poorest people in the world, and Jiva aims to change that.

e. I encourage more of you to ride on the momentum of corporate venturing in Singapore to launch innovative projects that can grow your business and improve lives.

9. Yet another way for companies to innovate is to crowd source solutions to your challenges.

a. ESG and IMDA jointly started the Open Innovation Network with this end in mind, bringing together start-ups, corporates and researchers to address industry challenges. By reaching beyond corporate borders, a company can develop better and more cost-effective solutions in a shorter time.

b. In the past two years, despite COVID-19, more companies, locally and from outside Singapore, have participated in these challenges. So far, nearly 200 challenges have been posted, with more than 1,500 responses to these challenges.

c. To reach out to other innovation nodes, companies can also tap on the Global Innovation Alliance to connect with hotspots in Silicon Valley, London, Shanghai and other parts of the world. Through partnership forums and co-innovation projects, companies can create new value and new products.

10. A third way for companies to innovate is to strengthen your nexus with our researchers.

a. Over the years, companies based here have set up a number of corporate labs in our universities. I personally visited a few, including the Rolls-Royce lab at NTU.

   i. The Rolls Royce corporate lab was the first to be established between a company and our university. Its work includes integrating advanced manufacturing, digital technologies and sustainable solutions into flight systems and engines. The combined investments in this lab exceed $160million.

b. Another way to collaborate is through tech consortia and other programmes, where we bring together researchers and companies to understand specific tech areas and solve emergent industry needs.

   i. I recently visited AI Singapore. Industry partners and researchers shared with me how they are piloting the use of AI to solve challenges – such as increasing the accuracy of the analysis of cancer tumours, better clustering of collection and distribution points for more efficient door-to-door delivery, and better positioning of ambulances to respond more swiftly to emergencies.

c. I am encouraged to see many other collaborations emerging, and leveraging the research capabilities that we have built up over the decades.

   i. For example, food and consumer research is one of the key areas for A*STAR. A*STAR is collaborating with many companies – including P&G and Wilmar – to innovate in these areas. Recently, Perfect Day, which produces alternative dairy, has committed to setting up a R&D centre with A*STAR.

11. I have highlighted different ways that larger companies, across different industries, are seeking ways to build their innovation capacity.

a. I hope that more of our larger enterprises will shift gears when it comes to innovation in the next phase of their growth.

Innovating in Areas Where We Can Make the Most Impact

12. The second shift is that we must channel our innovation efforts towards the areas where we can make the most impact. As I mentioned earlier, what we invest in our R&D efforts is a fraction of the global total. To make an impact, we need to be focused, nimble, and action-oriented.

13. In RIE 2025, we are focusing our research and innovation resources on solving national challenges and riding the key waves of global growth. Our efforts are focused on four key domains.

    a. One, in human health and potential. The pandemic has illustrated the importance of developing a deeper understanding of the threats to human health. We are also facing a rapidly ageing population and low birth rate. So, we must enable our people to enjoy good health, and to realise their full potential.

    b. Two, in urban solutions and sustainability. As a city-state, land and carbon are binding constraints for Singapore. If we can overcome these constraints to achieve sustainable growth and net-zero emissions, we will not only be doing our part for the planet, but can also support others in their journey.

    c. Three, in manufacturing, trade and connectivity, we will continue to invest in advanced manufacturing amid Industry 4.0. As global supply chains evolve, there is also greater emphasis on resilience and connectivity.

    d. Four, in Smart Nation and Digital Economy, we seek to ride the digital revolution and maximise the value created by digital innovation.

14. To achieve greater impact in our innovation efforts, besides the focus areas that I have just touched on, another aspect is for companies to be nimbler with their business models and find synergy with the rest of the eco-system.

a. Take for example Keppel O&M and Sembcorp Marine. Both companies have deep capabilities in producing rigs for offshore oil and gas. These rigs can withstand massive waves and the roughest seas. But their business models have been disrupted by the shift away from fossil fuels to renewable energy.

b. Building on their capabilities in offshore platforms, talks are underway to explore a merger of both companies to accelerate the pivot to offshore renewables, such as offshore wind and hydrogen. There is much potential for them to work with the rest of the sustainability eco-system on new energy storage solutions, hydrogen research, and other areas.

15. Another way to achieve greater impact in our innovation efforts is to have a greater action-bias. Innovation to address complex problems are often better addressed through learning by piloting, rather than having protracted deliberations.

a. Last year, we started a new approach to public-private partnerships called Alliances for Action, with a strong bias towards action. These ground-up efforts bring together various stakeholders and government agencies to pilot new solutions for industry challenges.

b. Nine Alliances have been launched so far, and the results are promising. For example, the Alliance on Sustainability led to Temasek, SGX, Standard Chartered and DBS Bank setting up a global carbon exchange in Singapore – Climate Impact X. The Alliance on Supply Chain Digitalisation led to the development of a common data infrastructure for companies to exchange data easily and securely, aptly named the Singapore Trade Data Exchange or SGTraDex.

16. To sum up the second shift, it is important that we focus on developing our niches, stay nimble with our business models, and take a greater action-bias in a fast-moving world.

Power the changes that require long gestation and patient capital

17. The third shift is that we must be prepared to invest in innovation efforts across different time horizons and have patient capital for changes that require long gestation.

    a. Many successful start-ups exit after several years – for example, payment companies took on average 4 years, and e-commerce platforms 5 years. But deep tech start-ups usually take much longer to exit. From research discovery, to crossing the valley of death, to productization – this can take many years.

    b. Take Nanofilm for example. The material science company was founded in 1999 as a NTU spin-off, based on founder Dr Shi's research work while he was with the university. It took more than two decades, before the company was listed on SGX.

    c. Seeing through such an endeavour requires both great resilience from the researchers and patience from the investors. Today, we have a number of spin-offs along this innovation journey – including Lucence, which focuses on advancing precision diagnostics; MiRXEs, which specialises in mRNA early cancer detection; and Prominence Photovoltaics, which develops high-performance solar cells.

    d. To our researchers in the audience, we are doing our best to support you on your innovation journey, should you decide to commercialise your research discoveries. We are also training a cadre of individuals who are bilingual in both science and business to better enable this translation process.

18. **More broadly, we are seeing more venture capital invested in deep-tech. I am pleased to learn that Temasek is planning to invest $1 billion per year in deep-tech investments across a range of domains. These include advanced manufacturing, disruptive materials, net zero tech, life sciences, and FoodTech. Through these investments, we can strengthen our position in the global technology supply chain. And I hope that Temasek will develop new global champions from these investments in time to come. I also welcome investors who are focused on innovation to find opportunities in Singapore, and through Singapore in the region.**

19. On our part, the Government is continuing to broaden the base of scientific capability and intellectual property that our companies can tap on by investing in basic research.

    a. Basic research requires an even longer gestation period, and you can never be sure when the research discoveries will be useful. For example, Prof Wang Linfa's work on bat-borne viruses over the past two decades laid the foundation for the cPass serology test for COVID-19.

    b. Over the years, we have developed several leading research centres, including the Centre for Quantum Technologies in NUS, the Singapore Centre for Environmental Life Sciences Engineering in NTU, and the Lee Kuan Yew Centre for Innovative Cities in SUTD.

    c. We are committing one-third of our R&D budget – or $8 billion over the next five years – in basic research. We have also been able to attract and retain a critical mass of top scientific talent to work on challenging research problems. Some of them are here today.

20. To our larger companies in the audience, I encourage you to build up a deeper stack of intellectual property and intangible assets, and turn them into competitive advantages. Our research institutions would be happy to partner you in this endeavour.

    a. I met up with Mr Daren Tang, the Director General of the World Intellectual Property Office, when he was back on home leave recently. He is the first Singaporean to assume this position. In our discussion, we spoke about how Singapore can play an important role in the development and protection of intellectual property.

    b. Globally, many companies have thoughtful ways to deepen their IP stack, planning ahead by developing IP roadmaps to support their business strategies. I hope that many of you here will similarly do so, building on our position as an IP node. This journey is not easy. But this is increasingly critical to survive and even thrive in a more competitive world.

21. So even as we power the flywheel, we must channel some of the momentum towards longer gestation efforts, as this is where we can build lasting competitive advantages if we make the right investments and see through the long innovation cycles.

Conclusion

22. Let me conclude. Despite the many challenges posed by COVID-19, I am glad that so many of you are here today to power the flywheel of innovation and to help our innovation eco-system shift gears.

    a. I have covered how we can connect more gears in the machinery to the flywheel, by making innovation much more pervasive.

    b. We must maximise the flywheel loop, by innovating in areas where we can make the most impact, which will in turn spur greater innovation.

    c. And we must build up the flywheel angular momentum, to power the changes that require long gestation and patient capital.

23. I hope today's program will inspire you to continue to innovate and experiment, and to keep the flywheels of innovation going. Have an enjoyable day as you explore the programme ahead. Thank you.