

**SPEECH BY MR S ISWARAN, MINISTER FOR TRADE AND INDUSTRY
(INDUSTRY), DURING THE COMMITTEE OF SUPPLY DEBATE UNDER HEAD V
(MINISTRY OF TRADE AND INDUSTRY) ON THURSDAY, 7 APRIL 2016**

“Positioning our economy for new growth opportunities and value creation”

INTRODUCTION

1. Madam Chairperson, I thank all Members who have spoken on our industry development strategy and raised a wide range of questions which I will now endeavour to address.

THE COMMITTEE ON THE FUTURE ECONOMY

2. Ms Cheryl Chan asked about our strategy to generate sustainable economic growth and create good jobs for Singaporeans. This, in fact, is the focus of the Committee on the Future Economy (CFE), which Mr Liang Eng Hwa enquired about.

3. Madam, the CFE is the latest edition in our continual effort to look ahead and prepare for longer-term challenges and structural changes, even as we manage some of the short-term cyclical challenges in our economy. We have done so previously with the Economic Review Committee in 2001 and the Economic Strategies Committee in 2009. This resolute focus on the long term has been our hallmark – you could even say our competitive advantage – in the way we work on the economy.

4. In consultation with industry leaders, the CFE is studying trends that will underpin the next wave of growth in markets and sectors. It is a national effort to understand the threats and opportunities that these trends present, as well as what we need in this next phase – in terms of corporate capabilities, connectivity, infrastructure and skills – so that we can sustain our economy well into the future.

TRENDS ARE RESHAPING THE ECONOMIC ENVIRONMENT AND INDUSTRIES

5. Madam, the changes in global trade patterns and market integration that Minister for Trade Lim Hng Kiang talked about as well the new technologies and novel business models that Mr Liang Eng Hwa and Ms Sun Xueling referred to are some of the forces that are reshaping the global economic environment, disrupting industry structures and value chains, and also changing the nature of jobs.

6. China’s insourcing of intermediate goods and services, and similar trends in the US in terms of re-shoring, will have a major impact on distributed manufacturing networks and cross-border supply chains. Meanwhile, India, ASEAN and other emerging markets have a growing middle class that is demanding more sophisticated products and services.

7. New technologies are blurring traditional industry boundaries and creating hybrid sectors like fintech. They can also transform existing industries. For example, 3D printing and advanced robotics can revolutionise manufacturing. Many Members have talked about this earlier, and the impact is in terms of rapid prototyping, optimised design and vastly improved operational efficiencies.

8. As for digital technologies, such as big data, the Internet of Things, artificial intelligence and the Cloud, these enable innovation and new business models for companies to access markets and address evolving preferences of consumers, anywhere in the world, at any time. For example, e-commerce is transforming retail. With big data and predictive analytics, retailers can better target customers in markets everywhere.

9. These changes, coupled with our domestic constraints, affect different sectors differently. An enterprise-level response, while necessary, is not sufficient given the nature and scale of these challenges. This is why we need broader sector-focused strategies that systematically harness innovation, talent development and partnerships to sustain the competitiveness and growth of our economy and industries. And that is the essential thrust of the Industry Transformation Programme.

IMPORTANCE OF MANUFACTURING TO SINGAPORE'S ECONOMY

10. How will we do this? I want to illustrate this using the manufacturing sector. Dr Tan Wu Meng commented on its strategic value, and Mr Yee Chia Hsing asked for the Government's view on its importance.

11. Madam, the manufacturing sector is a key pillar of our economy that accounted for nearly 20 per cent of nominal GDP in 2015. Although that is slightly lower than in 2010, largely due to the relatively faster growth of financial and insurance services (amongst others), the real value-added of the manufacturing sector in fact increased by \$4.6 billion over the same period. That's compounding at about 1.4 per cent per annum. Some have commented on the decline last year, but that is specifically due to the impact on 1 or 2 particular sectors, especially marine & offshore (which was due to oil-related effects).

12. Manufacturing productivity is also higher and has grown faster than the overall economy. From 2009 to 2015, real value-added per actual hour worked in the sector grew by 6.1 per cent per annum, higher than the 2.7 per cent for the overall economy.

13. Manufacturing, which employs more than half a million people, continues to provide good jobs not just in the sector alone but in related areas like research and development, after-sales services and distribution. In 2015, more than 60 per cent, or 6 out of 10, of the resident workers in the sector were in skilled jobs. This is higher than that for the overall economy. Median wages in the manufacturing sector are also higher than that for the overall economy.

14. In addition, the sector generates healthy spillover benefits for the rest of the economy through its wide range of inter-industry linkages. Based on MTI's estimates, a \$1 billion increase in manufacturing value-added through an increase in final

demand will generate about \$300 million of value-added and 2,400 jobs in the rest of the economy. This spillover impact is substantial.

WE WILL POSITION OUR MANUFACTURING SECTOR FOR THE FUTURE, BUILDING ON OUR STRENGTHS AND LEVERAGING DISRUPTIVE TECHNOLOGIES

15. For all of these reasons, manufacturing remains important to our economy. But the nature of manufacturing is changing and we must undertake several measures to ensure that the sector is well-positioned for the future.

(i) Investing in advanced manufacturing technologies

16. First, we will continue to invest in advanced manufacturing technologies such as additive manufacturing and robotics. We will also promote their adoption across different verticals.

17. The global robotics industry is projected to grow from US\$27 billion in 2015 to US\$80 billion by 2025. To seize this opportunity, we will invest over \$450 million through the National Robotics Programme (NRP) in the end-to-end development of robotics technology. This will include public-private partnerships between research institutions, companies and public agencies, to pilot robotics technology applications across various industries.

18. We will also support the mass adoption of robotics across sectors to drive productivity. In fact, EDB and SPRING are working with technology partners and system integrators locally to develop standardised and scalable modular robotics solutions. This will allow SMEs to mix and match these modules to suit their needs. Importantly, the cost of adoption can also be reduced by about 50 per cent.

19. Mr Leon Perera would be interested to know that there are potential robotics applications for the services sector, currently being worked on in Singapore, to automate manual tasks, raise productivity and address manpower challenges. In elder care, the use of assistive technology can ease the burden on healthcare professionals and caregivers, and nursing homes such as Peacehaven are already exploring possible applications. Similarly, with STB's support, two robots will be deployed from June this year in Park Avenue Rochester Hotel for housekeeping and back-of-house functions, such as the transportation of linen, refuse and bulky items. If you go there, you may not see it as everything is back-of-house. But there are plans to take it further to front-of-house functions such as delivery of luggage or room service to guests.

20. As for the adoption of robotics in areas where there is human interface, or what Mr Leon Perera called "social robotics", this will take more effort, especially in terms of how these devices are calibrated to serve their intended purposes and to respond to human needs. Significant effort is being taken and part of it is what we are trying to do in some of these verticals.

(ii) Capturing opportunities from new business models

21. Second, many new business models are emerging in manufacturing and expanding the notion of manufacturing. We will work with the industry to capture the opportunities that arise.

22. Let me give you an example. Medical technology firms are using analytics and going beyond producing medical devices to providing digital healthcare solutions. EDB and MOH supported the Eastern Health Alliance to establish their innovation team at Changi General Hospital, which focusses on working with industry to test-bed new healthcare solutions. This team partnered Philips Healthcare to jointly develop a tele-health program for heart failure patients in Singapore, helping to care for their health – and more importantly reduce the risk of re-admission – via tele-monitoring, education and customised care plans. EDB also worked with Philips to establish its Asia Pacific Centre of Excellence for its hospital-to-home business unit in Singapore. This is an example of how a firm in manufacturing is also going into providing solutions or services which complement manufacturing. There are other examples in areas such as aviation and aeronautics, and this is something we want to continue working on.

(iii) Enabling infrastructure

23. Dr Tan Wu Meng highlighted the need to bring together industries and disruptive technologies of tomorrow. This is a very important point because many new opportunities lie at the confluence of different industries and technologies.

24. Physical proximity is one way to encourage greater interaction among enterprises, solution providers and researchers that could spark novel ideas and create new products. We have done this at one-north, which is home to some 250 leading companies and many global institutions, incubators, start-ups and public research institutes, which collectively create about 40,000 jobs. This rich ecosystem has spawned many collaborative projects in biomedical sciences, infocomm, physical sciences and engineering.

25. The 600ha Jurong Innovation District (JID) can do the same for the manufacturing sector. Several new growth areas could be housed there, such as advanced manufacturing, robotics, urban solutions, cleantech and smart logistics. The entire manufacturing value chain could also be hosted at JID, including R&D, design, prototyping, production and supply chain management. Further, companies would have access to NTU's research and engineering capabilities. JTC's LaunchPad @ JID will also be completed in 2017 to support start-ups, incubators and accelerators.

(iv) Talent development

26. Ultimately, Madam, we must ensure that our people benefit from these changes and exciting opportunities, as Dr Tan Wu Meng has emphasised. Under SkillsFuture, the tripartite partners are working closely with education and training institutions to equip Singaporeans with the requisite skillsets under various Sectoral Manpower Plans.

27. Sir, may I have your permission to display some slides on the LED screen please.

28. One example of a Singaporean who has acquired new skills to meet the needs of his industry is Mr Mohd Jamil Bin Mohd Said from Sanwa-Sayama Precision Engineering Pte Ltd. Mr Jamil joined Sanwa in 1998 as a technician specialising in mold-making. In 2012, he enrolled in the Precision Engineering Master Craftsman Programme conducted by Nanyang Polytechnic, where he acquired technical skills such as machining process design. Upon graduation with a WSQ Diploma in Precision Engineering (Master Craftsman Skill) and a WSQ Specialist Diploma in Precision Engineering, Mr Jamil now oversees the mold-making team and facilitates the automation of machining processes. This is a very good example, and there are many others like him. We need similar efforts for all sectors, and Parliamentary Secretary Low Yen Ling will elaborate on how SkillsFuture can better equip Singaporeans for jobs of the future.

(v) Partnerships

29. Members have noted that partnerships are central to these industry transformation efforts. Mr Randolph Tan asked whether such coordination and cooperation can be balanced with the natural competitive instincts of an open-market economy.

30. On the face of it, this inherent tension seems irreconcilable. However, we have always encouraged and nurtured close partnerships between diverse stakeholders in the business ecosystem – some among “natural partners”, and others among competitors. Let me illustrate what I mean.

31. We have supported “natural partners” through schemes such as Partnerships for Capability Transformation (PACT), where large enterprises upgrade their suppliers’ capabilities, through sourcing and qualification processes, for mutual benefit. Last year, PACT was enhanced to support activities like joint product development between large enterprises and their suppliers.

32. We have also brought competitors together in collaborative projects. An example of this is A*STAR’s Aerospace Research Consortium which brings together Airbus, Boeing and Embraer to undertake pre-competitive research in complex problems facing the industry. There are other examples like this, not just in collaboration with the Government but also in the private sector where more companies are embracing the idea of open innovation and working collaboratively.

33. These sort of partnerships are not dysfunctional, and are born out of the recognition that even competitors stand to benefit when they cooperate in certain parts of the business process. This could be because there are areas which are very complex, or because the cost barriers could be very high. A collective effort tends to achieve better outcomes, which would be shared.

Industry Transformation Programme

34. Mr Henry Kwek and Mr Randolph Tan asked how the Industry Transformation Programme differs from our current approach.

35. Sir, at the enterprise level, the Government will continue to support our companies in their innovation, productivity, skills upgrading and internationalisation efforts. However, the nature of current trends and challenges calls for broader strategies at the sectoral level. There are useful products or services which the market may not yet be ready to supply or adopt. Take, for example, modularised robotics solutions. These may not yet be market-viable, and we need to go into this area proactively in order to generate the solutions which can be adopted. Under the Industry Transformation Programme, what we can do is to bring stakeholders and resources together, with sufficient scale and focus, to support each sector's development and respond to the differing challenges that they face.

36. And we do not underestimate the scale of this challenge. This is a point that several Members have made. Industry transformation is a challenging task and it will require deeper partnerships between large and small companies, public research institutions and private enterprises, as well as TACs, unions and the Government. Each will bring an important perspective. The Centres of Innovation, for example, will have a view on the technology landscape. The TACs will have a better grasp of industry trends and what the needs of their members are. The unions will have a view on how skills training and workforce development can take place. We need to bring all of these together to address salient issues in the medium to longer term for our sectors.

37. To coordinate and execute the Industry Transformation effort, we will appoint "cluster champions" from agencies such as EDB, SPRING and IE Singapore. They are not the only ones, as there are other agencies looking at different sectors. I understand Mr Randolph Tan's fear that this might impose excessive administrative burden on our agencies, but our experience as well as the plans that are being formulated suggest that it should result in a tighter coordination of effort and more effective use of resources. We will have to implement and work on this, and it will be an iterative process as we go forward.

SUPPORT COMPANIES TO ADOPT TECHNOLOGIES AND SCALE UP

38. Sir, the Industry Transformation Programme will be complemented at the enterprise level with targeted efforts to support businesses in adopting technology and scaling up for the next phase of restructuring.

Automation Support Package

39. Key to this is the Automation Support Package announced in this Budget. Over the next 3 years, \$400 million of support will be available for more than 300 automation projects. This will comprise 3 elements: the enhanced Capability Development Grant (CDG) which supports 50 per cent of full scale automation project costs up to \$1 million, the new 100 per cent Investment Allowance (IA), and the enhanced Local Enterprise Finance Scheme (LEFS). Let me illustrate how a company could benefit from this new package.

40. Consider Mr Tan, the owner of a local medium-sized food manufacturing business, with plans to automate and increase production for export.

41. He engages a system integrator to study the automation project, with a consultancy and installation fee of \$200,000. He then invests \$1.8 million to purchase three robotic arms and a conveyor belt system that integrates the packing and palletising process.

42. Under the enhanced CDG, Mr Tan will receive a support grant of \$1 million, defraying \$100,000 of consultancy and installation fees, and \$900,000 for the cost of capital investments. Mr Tan will also receive 100 per cent IA on the remaining capital investment of \$900,000, which will translate to about \$153,000 of tax savings. Finally, Mr Tan can obtain financing for the equipment purchase from financial institutions that are participating in the enhanced LEFS. The Government's risk-share has been increased from 50 to 70 per cent for SMEs, and this should improve Mr Tan's chances of securing a competitive loan for the equipment purchase.

43. With the capacity to scale production, he can also tap on IE Singapore's schemes, such as the Market Readiness Assistance and Global Company Partnership, in order to go overseas.

44. Taken together, this is a package which will deliver substantial benefits to SMEs who are prepared to take the decision to automate.

SHIFTING OUR ECONOMY TOWARDS VALUE CREATION

45. Let me now turn, Sir, to the issues beyond industry transformation. In particular, we need to fuel growth and value creation by generating new ideas, products, services and business models. Entrepreneurship and innovation are two important enablers and many Members have spoken about this.

ENTREPRENEURSHIP - STRENGTHENING OUR ECOSYSTEM FOR START-UPS TO SCALE

46. Mr Henry Kwek asked about the progress of the Government's efforts to develop a start-up ecosystem.

47. Over the years, start-up activity has increased, with the number of start-ups in Singapore more than doubling from 24,000 in 2005 to 55,000 in 2014. Our start-ups have also attracted more investor interest, which is one measure of their quality. The number of venture capitalist deals doubled from about 70 in 2007 to 140 in 2013, with aggregate deal value increasing seven-fold from \$120 million to \$860 million.

48. Importantly, our efforts to nurture the start-up ecosystem have allowed budding entrepreneurs to fulfil their aspirations. Associate Professor Tina Wong is an example. She is the co-founder and CEO of Peregrine Ophthalmic, a local biotech start-up. With SPRING's support, and together with her co-founders Deputy President and Provost of NTU, Professor Freddy Boey, and Chair of the School of Materials Science and Engineering in NTU, Professor Subbu Venkatraman, Associate Professor Wong has developed the world's first sustained-release nano-medicine for ophthalmology for the treatment of glaucoma. Her start-up has attracted the attention of the world's top 5

pharmaceutical companies, and will make inroads into the global glaucoma drugs market worth US\$4.3 billion, potentially benefiting up to 80 million glaucoma patients by 2020.

49. Mr Henry Kwek also asked about the Government's future plans to support the growth of start-ups in Singapore. We plan to strengthen the ecosystem by supporting innovative start-ups to scale through (i) internationalisation, (ii) partnerships, (iii) an enabling regulatory environment, and (iv) talent development.

(i) Internationalisation

50. First, on internationalisation. There are more and more opportunities for our start-ups to scale through digital internationalisation. Indeed, you could say that many of these companies are born global because they can access international markets from the moment they start. BeMyGuest is a local start-up that recently became the first Singaporean company to be featured on Fast Company's "World's 50 Most Innovative Companies List 2016" for its online travel platform. IE supported this company in its digital integration with Ctrip, China's largest online travel agency. This has allowed BeMyGuest to establish tie ups with 25 other Chinese partners, and increase bookings by over 100 times in a period of 9 months. This is the power of digital access to markets. This year, the company is also working with IE to penetrate other Asian markets such as Japan, India, Indonesia and Korea.

51. SPRING and IE will continue to support our companies, including the start-ups, to build capabilities in areas such as customer analytics, social media marketing, mobile commerce and digital platform development to benefit from the global digital economy.

(ii) Partnership

52. Second, on partnerships. What we see more and more are large enterprises embracing open innovation to access new technologies and ideas. EDB and SPRING have been working with MNCs and LLEs to undertake corporate incubation and venture activities, as well as co-innovation partnerships with our start-ups. With such partnerships, our start-ups will have the financial resources, expertise and networks to scale.

(iii) Enabling regulatory environment

53. On regulatory environment, let me use the medtech industry as an example. The Health Sciences Authority (has) has been adopting a risk-based approach to the regulation of medical devices by ensuring that the controls commensurate with the risk of the devices to individual health. HSA has also expedited approval for devices that have been cleared by reference agencies. More recently, they introduced the online Medical Device Risk Classification Tool, which allows companies to quickly identify the risk classification of a medical device within 5 to 10 minutes. This is important because the risk classification tells them what regulatory hurdles they face, and 5 to 10 minutes is, to put in context, much faster than the previous 1-2 weeks of paper-based processing. HSA and other regulators are exploring how we can create enabling environments without compromising their core objectives.

(iv) Talent development

54. Mr Azmoon Ahmad asked about our efforts to nurture entrepreneurs. We will continue to provide support for mentorship through initiatives such as SPRING's Incubator Development Programme (IDP). Under this programme, incubators and accelerators are supported with grants to enhance their capabilities and programmes, including the engagement of mentors. Through the 21 incubators and accelerators supported under IDP, about 90 industry professionals have been engaged to provide mentorship and expertise to our start-ups. This is something we can scale according to the needs and response.

INNOVATION – ENHANCING COMMERCIALISATION AND TRANSLATION OF R&D

55. Let me move on to the point on innovation. I agree with Ms Foo Mee Har and Ms Chia Yong Yong who emphasised the need to ensure that value is created for Singapore from our \$19 billion investment in RIE 2020 and our broader investments in R&D.

56. Our investments in R&D have strengthened our innovation ecosystem and created value for Singapore. One measure is the number of research scientists and engineer (RSE) jobs in Singapore, which has increased from 19,000 in 2004 to 33,000 in 2014. That is a significant increase and importantly, 70 per cent of those jobs are held by locals.

57. Another measure is business spending on R&D, which has doubled from \$2.6 billion to \$5.2 billion in the same 10-year period, catalysed by public spending on R&D. So businesses have been catalysed to spend more on R&D, and we also see a commensurate enhancement in the capacity, especially in the local talent pool, to meet those needs.

58. Importantly, our R&D investments have also enabled new industries to grow. Our biomedical sciences (BMS) R&D initiative, which was launched in 2000, has spawned a strong BMS sector contributing over \$12 billion in value-added (VA) and employing more than 18,000 people in 2014. As reference, in 2000, the VA from the BMS sector was about \$4 billion, so we have seen a significant increase.

59. We also have a framework to track key performance indicators of our R&D investments. These range from input measures, such as R&D intensity and researcher intensity (relative to comparable economies, for benchmarking), to measures of the quality of research, such as citations and papers published, to measures of value creation through commercialisation – which several Members talked about – such as licensing and spin outs.

60. Ms Chia asked about the treatment of IP ownership arising from our R&D activities. In general, A*STAR retains ownership of the IP that it develops; where IP is jointly developed with a collaborator, including from the private sector, the IP may be

jointly owned. We have multiple mechanisms to facilitate the use and commercialisation of that IP later on. Licensing is one of the mechanisms.

61. Beyond the licensing of IP, we have longer-term initiatives to align our R&D investments with the needs of companies and the economy. The Industry Alignment Fund (IAF), introduced under RIE 2015, seeks to tighten linkages between our R&D capabilities and the industry's needs. We are trying to bring the research in our research institutes closer to industry and this fund is one mechanism to do that. To-date, it has supported about 600 projects that were carried out in collaboration with industry or that developed capabilities needed by industry.

62. Under RIE 2020, IAF funding will be increased by \$200 million to \$1.8 billion to catalyse more of such public-private research collaborations. We are adding to that fund because we want to emphasise the R&D efforts in a way that is aligned with the industry.

63. The IAF is also being adapted to meet the changing needs of industry, which are becoming more complex and increasingly tap on a diverse spectrum of capabilities. Take, for example, Nestle. They see opportunities in combining traditional food manufacturing capabilities with sophisticated biomedical knowledge, especially on nutrition and formulations. The Nestle Research Centre (NRC) Asia was hence established here to leverage A*STAR's research capabilities to develop new nutritional products.

64. We will allocate about \$660 million to this form of IAF-Industry Collaboration Projects, which will draw on the best researchers and capabilities across our public research community. And we will require – this goes back to the point about what we expect in return – tangible contributions from industry partners, in cash or in terms of the resources that they commit. Very often, these commitments are also made in parallel with other kinds of activities that they are undertaking in Singapore.

65. I want to make one final point on this. And I know this is not the intent of Ms Chia's comment – she qualified that - but I want to re-state it. We should be cautious not to adopt a parochial attitude towards innovation or the ownership of IP. Some of the best outcomes in innovation are produced only when it is undertaken in an open and collaborative manner, and we must preserve that environment for our R&D ecosystem. We must maintain an open innovation ecosystem that fosters collaboration between multiple stakeholders, whether public or private, large or small, local or foreign. Such R&D activities bring valuable benefits to Singapore, which I have enumerated.

66. Ms Foo Mee Har, Mr Saktiandi Supaat and Ms Sun Xueling rightly pointed out that innovation should play a key role in the push for our SMEs to transform, and we will enhance SMEs' access to technologies and expertise.

(i) Enhancing SMEs' access to technologies

67. One way is through the Intellectual Property Intermediary (IPI) under A*STAR which has helped our companies source technologies locally and overseas. So far, they have matched more than 70 companies. Recently, the IPI was transferred to

SPRING. The level of technology transfer that is relevant to the SMEs will be significantly improved through SPRING's network of SME centres and TAC partnerships.

68. There is also an initiative to simplify licensing terms for SMEs. I was very pleased to learn that A*STAR's licensing agreements are now shorter and use simpler language – we could all do with simpler language. This has reduced the time required for licensing significantly.

(ii) Enhancing SMEs' access to R&D expertise

69. We will also do more to grow the in-house innovation capabilities of our SMEs. A*STAR and SPRING's GET-Up Programme second our public researchers in IHLs, research institutes and polytechnics to the SMEs to undertake innovation projects. In other words, they become the employees of companies in order to work on research blueprints or specific projects, which in many cases have gone to become commercially valuable. To-date, more than 600 researchers have been seconded to SMEs.

70. Under RIE 2020, we will enhance the programme to second senior research scientists and engineers (RSEs) to SMEs.

ENERGY - THE BASICS TO SUPPORT THE FUTURE ECONOMY

Energy security

71. Sir, may I finally turn to our goal of ensuring a secure, reliable and sustainable supply of competitively-priced energy to our economy. Mr Low Thia Kiang asked about the Government's plans to enhance and diversify our energy sources.

72. We have taken significant steps in this regard. Our liquefied natural gas (LNG) terminal, which commenced operations in 2013, allows us to geographically diversify our sources of natural gas, which is our main source of energy. This is an important strategic step and we should not underestimate its value to Singapore. We have been expanding the terminal's capacity and the 4th tank could be completed by 2018, which would take throughput capacity to 11 million tonnes per annum. EMA is also studying if there is a need for even more capacity.

73. Further, we are studying the feasibility of electricity imports in the medium to long term, and this is why the ASEAN Power Grid (APG) is relevant. It is a plan to have common grid infrastructure for an integrated ASEAN electricity market, and to-date, 6 of the 16 planned bilateral interconnection projects have been completed, including one between Singapore and Peninsular Malaysia.

74. Mr Low Thia Kiang also asked about the potential impact to Singapore should our neighbours embark on nuclear power programmes. The pre-feasibility study completed in 2012, which he noted, concluded that the then-available nuclear energy technologies were not suitable for deployment in Singapore.

75. Nonetheless, we are strengthening our capabilities to understand nuclear science and technology. This would allow us to assess the implications of evolving nuclear energy technologies and regional nuclear energy developments on Singapore.

76. In April 2014, the Government announced a \$63 million Nuclear Safety Research and Education Programme (NSREP) to support capability development in this space. The NSREP comprises the Singapore Nuclear Research and Safety Initiative (SNRSI), which focuses on research and developing capabilities in nuclear safety, science and engineering, as well as the Nuclear Education and Training Fund (NETF), which supports education and training in these areas. 4 research projects commenced in 2015 and we expect the remaining 5 to commence in 2016.

77. In terms of scholarships, 9 scholarships have been awarded thus far. Mr Low Thia Kiang commented that this is lower than expected. Nuclear energy, however, is a rather specialised field. We have conducted outreach to attract students to take up studies in this field, and we will continue to invest in these efforts significantly. Importantly, this is also about working with nuclear technology partners in established places, such as France and the US, to add to our knowledge and capability to understand nuclear science and technology.

78. Finally, countries that deploy nuclear energy have to be accountable to their populations and their regions, and ensure that high safety and security standards – based on those set by the International Atomic Energy Agency (IAEA) and international conventions such as the Convention on Nuclear Safety – are adhered to. This is true for both operations and the disposal of nuclear waste, which Mr Low Thia Kiang mentioned. It is important that our region collectively builds and strengthens our emergency preparedness and response (EPR) systems as nuclear and radiological emergencies know no boundaries. We are working with ASEAN countries through the ASEAN Network of Regulatory Bodies of Atomic Energy (ASEANTOM) and the IAEA to strengthen cooperation in this area, as well as to share radiation monitoring data.

Price competitiveness

79. Mr Low Thia Kiang asked if electricity prices can be delinked from oil and linked to natural gas or LNG instead. The crux of the matter is not about picking the source of energy supply. Instead, what we want to do is create options in Singapore for buyers of electricity. This would give them the opportunity to create a portfolio which they think best suits their risk appetite and hedges against the movements that they are concerned about. The SGX LNG Index Group (SLInG), which Mr Low Thia Kiang highlighted, is a possibility but it is new and not quite ready yet for this sort of indexing. But there is potential, and we want to see how the market responds.

80. On full retail contestability, we will, as announced, have full retail contestability in the electricity market by 2018. And we will certainly need to have a comprehensive education programme before embarking on this to make sure that households and individuals understand what this is about.

81. I would also like to make two important points. First, we need to get the system right before we talk about communication, and this is what we are working on now.

Getting the system right is not simply about the technical aspects, but also about who the potential suppliers are, how they come in and what kinds of packages they offer.

82. Second, we also want to make sure that there is a default fall-back option for households, precisely because some households may not be able to fully appreciate the decision or may not want to make those choices. These are some of the policy aspects that are being worked out. Once we are ready, we will embark on the education programme to socialise our households to the opportunities.

CONCLUSION

83. Sir, I would like to end by emphasising that our economy faces important challenges arising from all the forces we talked about. This calls for proactive measures at the sector level, even as companies adapt to the challenges that they face. We are responding with the Industry Transformation Programme as well as efforts to boost entrepreneurship and innovation, in order to create value for our economy. This is a formidable task, but it is not insurmountable. The key is that we have all parties on board so that we are able to achieve these objectives. Thank you.