

**SPEECH BY SECOND MINISTER FOR TRADE AND INDUSTRY
DR TAN SEE LENG AT MTI'S COMMITTEE OF SUPPLY DEBATE 2024
ON 1 MARCH 2024**

“Unlock our resource potential”

Mr Chairman,

Introduction

A1. Singapore is a small nation with limited resource endowments.

A2. Despite so, we have grown to become a leading global city that we are today. But to sustain this growth, we will need to maximise our resource potential and turn these potentials into the next bound of success.

A3. My speech today will touch on how we can continue to push boundaries, to unlock our resource potential and to bring in new opportunities in four areas:

- i. First, **Energy and carbon**
- ii. Second, **Research and development, or R&D**
- iii. Third, **Manpower**
- iv. And last but not least, **land**

Energy and Carbon

B1. First, on energy and carbon.

B2. Climate change poses an asymmetric, long-term challenge to all countries across the globe. As a low-lying island-state, Singapore is disproportionately impacted by climate change.

B3. Our resource constraints are more stark compared to many other countries, which makes decarbonisation even more challenging. But even so, we firmly believe that Singapore can rise above these constraints and thrive in a net-zero future.

- i. Today, I will share more about our efforts to invest in new decarbonisation pathways, while ensuring a stable power system.

[Stable Power System, amidst Energy Transition]

B4. First and foremost, a stable electricity market along with a reliable and secure power system must be the foundation upon which we advance Singapore's energy transition.

- i. Over the past year, the Energy Market Authority (EMA) has implemented guardrails to strengthen our electricity market structure and reduce market volatility. These include (i) introducing a centralised process to facilitate and guide private investments in new generation capacity, (ii) placing more stringent regulatory requirements on electricity retailers to better protect consumers, and (iii) implementing a Temporary Price Cap mechanism to mitigate extreme price volatilities in the wholesale electricity market.
- ii. This year, we will also centralise the procurement of natural gas to ensure longer-term fuel adequacy for our power plants.
- iii. Alongside a stable electricity market, we need a reliable grid. **Mr Edward Chia** asked whether our power grid is robust enough to integrate diverse energy sources. While largely fueled by natural gas, our grid today already takes in other energy sources such as solar power and waste-to-energy, while maintaining high grid reliability. Over the next few decades, we expect more diverse energy sources to

enter our grid and we are upgrading our grid management systems in preparation for this.

[Progress updates - new generation capacity]

B5. Looking ahead, we expect electricity demand to grow with increasing digitalisation, economic growth and electrification, as **Mr Edward Chia** mentioned. EMA works closely with agencies to ensure that we have sufficient capacity to meet this demand. That is why we have launched tenders for new generation capacity in the form of greener and more energy-efficient power plants.

- i. EMA recently awarded YTL Power Seraya the right to build, own, and operate a Combined Cycle Gas Turbine, or CCGT. This CCGT will have a carbon intensity 10% lower than that of existing CCGTs in the system. It will be the third CCGT to be built that can run on hydrogen, which is a potential low-carbon fuel, and will be up by 2028. This is in addition to Keppel's and Sembcorp's hydrogen-ready plants which are currently under construction.

B6. Singapore's energy transition will be a multi-decade journey. In the meantime, natural gas will still play an important role over the next one to two decades. SLNG is therefore developing a second LNG terminal to meet our gas needs and strengthen our energy security.

[Progress update – electricity imports]

B7. While natural gas is the cleanest fossil fuel, we have to green our power supplies if we want to achieve our net-zero commitments. We are working on realising low-carbon electricity import projects, and studying low-carbon energy alternatives such as hydrogen and ammonia. **Ms Jessica Tan** would be glad to know that we have made good progress.

B8. For low-carbon electricity imports, our target is to import up to 4 GW of low-carbon electricity by 2035, making up around 30% of Singapore's electricity supply then.

- i. To **Mr Edward Chia**'s question, we are on track to achieve this target.
- ii. Last year, EMA granted Conditional Approvals to import up to 4.2 GW of low-carbon electricity from Cambodia, Indonesia and Vietnam. Companies are currently conducting feasibility studies and securing regulatory approvals from source and transit countries.
- iii. When realised, these projects will also form the building blocks of an ASEAN Power Grid.

[Progress Updates: low carbon alternatives]

B9. We are also studying the potential of various other low-carbon energy sources.

- i. For hydrogen, we will start with a small-scale pathfinder project to test and to deploy a direct ammonia combustion power plant, alongside ammonia bunkering. The Request for Proposal, or RFP, to select a lead developer for this project is ongoing and we will close this later this month.
- ii. Geothermal is another potential energy source that we are studying. We will be conducting a nationwide non-invasive geophysical study to assess Singapore's deep geothermal resource potential for power generation. EMA is evaluating the RFP proposals and we will also announce the award soon.
- iii. Advanced nuclear energy technologies and fusion energy are also potential game-changers.
 - a. We engage international organisations widely and countries with deep capabilities in nuclear energy to broaden our understanding of advanced nuclear energy technologies, including Small Modular Reactors. This is so that we can assess the suitability of these technologies for Singapore, once they are proven to be safe and viable.

- b. **Mr Xie Yao Quan** spoke about the potential of energy from the sun – fusion energy. While there have been significant breakthroughs in the fusion energy space in recent years, there still remain engineering challenges. Beyond the fact that there are no demonstrator plants today that can generate electricity, there are also other challenges including the low global supply of tritium, which is an important fuel for fusion. As such, there is a big difference in opinions among experts on when fusion can be commercialised safely. We are keeping a close watch on the development of fusion energy and we are collaborating with overseas research entities to build up capabilities in this field. We will continue to identify capabilities in our local ecosystem that are fusion-relevant and where we could potentially play a role in the fusion supply chain.

[Progress Update: LCER Directed Hydrogen Programme and Emerging Technology Grant Call]

B10. At the same time, R&D investments, such as those under the Low Carbon Energy Research, or LCER Programme, can help us realise the potential of low-carbon alternatives and support efforts to expand the range of technological solutions suited for Singapore.

- i. The Directed Hydrogen Programme under the LCER Programme supports research into technologies that can help Singapore import and use hydrogen safely and economically. I am pleased to announce that we will be awarding around \$43 million to support 6 research projects. These projects collectively seek to address key challenges that Singapore faces in deploying hydrogen, in areas such as energy efficiency, durability, and safety.
- ii. Beyond hydrogen, we also want to support research into emerging technologies with the potential to sprout into needle moving solutions. As part of the inaugural Emerging Technology Grant Call, we will award around \$12 million to support 10 research projects, which span a range of low-carbon technology pathways, such as energy harvesting.

[Progress update – international]

B11. Lastly, our close relationships with International Organisations, or IOs, help us to build capabilities to accelerate the energy transition.

- i. Last month, we announced the establishment of the International Energy Agency (IEA) Regional Centre in Singapore. The Centre is the IEA's first office outside of its headquarters in Paris, and also Singapore's first energy-focused international organisation.
- ii. The Centre will provide technical advice and policy support to governments and regional bodies to accelerate the energy transition, for example, through scaling up the deployment of renewable energy and other clean energy technologies.
- iii. We expect the Centre to be operational by end of this year.

[Future Energy Fund]

B12. Members, I have spoken at length on our plans to transition and decarbonise our Power sector.

B13. Despite our lack of indigenous renewable energy resources, Singapore must still embark on the energy transition to stay relevant in a world that is moving towards net-zero.

B14. I am glad that several businesses are already pioneering such clean energy projects, as **Mr Mark Lee** pointed out earlier.

B15. But to decarbonise, we will need to deploy clean energy at scale. This will likely involve nascent technologies, come with significant commercial and geopolitical risks, or require high upfront capital expenditures.

B16. All these would require substantial investment from governments and companies alike.

- i. The International Renewable Energy Agency earlier estimated that the world would require an estimated \$150 trillion USD worth of investments across all energy transition technologies to achieve net zero emissions by 2050.

B17. In instances where projects are of strategic value to Singapore's decarbonisation journey, the Government will provide support to catalyse the development of such projects. This may help Singapore secure reliable and cleaner energy supply, at the scale and speed required to meet our climate goals.

- i. It is with this in mind that the Government will set up the new Future Energy Fund, as announced by DPM Wong.
- ii. The Fund can support the infrastructure investments we need to deploy low-carbon technologies such as for hydrogen, when they are viable.

B18. We need to start saving for these investments now.

- i. We will establish the Fund within EMA, with an initial injection of \$5 billion.
- ii. And we will make legislative amendments to establish the Future Energy Fund later this year.
- iii. **Mr Edward Chia** asked if we would need to top up the Fund further. We will do so when our fiscal space allows for it, and depending on our development plans for the energy transition.

B19. The path ahead is not straightforward, and we will need to adapt and be nimble when circumstances change.

B20. But rest assured that the Government will take great care in charting our energy transition, to ensure that even as we decarbonise, we maintain our energy security, and we will remain cost-competitive.

- i. In particular, we are mindful of the potential impact of the energy transition on electricity prices. I would like to assure households and businesses that we will do our utmost best to calibrate the trajectory of our energy transition and its impact on electricity prices.
- ii. We will also continue supporting our lower- and middle-income households to mitigate the impact that the transition will have on electricity costs.
- iii. And we will continue helping our businesses reduce energy consumption, improve energy efficiency, and in turn, lower their energy costs.

[Continued Efforts to pursue industrial decarbonisation]

B21. Members, other than the Power sector, our industrial processes also contribute a significant portion of Singapore's emissions. We will need to actively pursue pathways to decarbonise our industrial processes. As mentioned by SM Teo in PMO's COS, one such pathway we are developing is carbon capture and storage, or CCS.

- a. CCS involves the capture of emissions from point sources – such as chemical plants or power plants. The carbon dioxide is then transported to suitable geological formations where they are injected and stored deep underground.

B22. We have been engaging companies interested to pursue CCS. Today, I would like to share that the Government will be working with **S Hub**, an industry consortium comprising ExxonMobil and Shell, to study the viability of developing a cross-border CCS project capturing emissions from Singapore. The Government will work with S Hub to evaluate the techno-economic feasibility of aggregating emission from Singapore, and collaborate with regional partners to study potential carbon dioxide storage sites.

- i. We are keen to work with like-minded partners to make cross-border CCS projects a reality and realise the potential of our entire region as a CCS hub.
- ii. Singapore recently signed a Letter of Intent (LOI) on Cross-Border CCS with Indonesia. Under the LOI, both countries will set up a workgroup to advance CCS cooperation between Singapore and Indonesia.

Research and Development

C1. Moving on to **R&D**.

C2. Continued investment in R&D is critical in ensuring that we maintain our edge and our competitiveness in other areas. As mentioned in the Budget speech, the Government will invest an additional S\$3 billion to our Research, Innovation and Enterprise (RIE) 2025 efforts to keep up our momentum on research.

C3. To **Ms Jessica Tan, Mr Shawn Huang** and **Mr Neil Parekh's** questions, MTI will double down on our efforts to support R&D investments, particularly in deep tech R&D for critical and novel technologies. Deep tech typically require a long development and commercialisation period, due to the extent of tech validation and the risks involved. Investments in deep tech would enable us to entrench R&D that diversifies our economy by growing new industry clusters, thereby generating new economic opportunities for Singapore, and propelling us towards innovation-led growth.

C4. We are creating new R&D translation platforms and we are providing additional resourcing to catalyse four key sectors:

- i. First, A*STAR will establish a National Semiconductor Translation and Innovation Centre (NSTIC) at a budget of about \$180 million, to foster collaboration and boost R&D translation outcomes in the areas of flat optics and silicon photonics, both of which are emerging areas relying on semiconductor fabrication technologies.

Semiconductor is a sector with significant barriers to entry due to high investment costs, with cleanrooms and machines that can cost millions of dollars. NSTIC aims to help companies and researchers overcome this by providing them access to semiconductor infrastructure and supporting prototyping and small volume manufacturing.

- a. I recently visited MetaOptics Technologies, a local startup that designs and fabricates flat lens and optical devices. These flat lenses are hundreds of times thinner than a human hair, allowing for size reduction for devices like optical sensors and cameras. MetaOptics intends to leverage NSTIC's research expertise and fabrication services to make devices locally, instead of having to outsource to overseas foundries which have higher cost and longer turnaround times. MetaOptics is also being supported by two scientists seconded to the company from A*STAR, through its Technology for Enterprise Capability Upgrading Programme (T-Up), which Mr **Desmond Choo** asked about earlier.

- ii. Second, A*STAR has launched a \$97 million Nucleic Acid Therapeutics Initiative (NATi) to position Singapore as the regional node for research, clinical translation, and commercialisation of RNA drugs and vaccines. Most of us would have heard about RNA vaccines during COVID-19. Singapore has actually been developing capabilities in RNA research over the years through sustained investments in biomedical R&D. Through NATi, Singapore will accelerate our development of RNA drugs and vaccines, and grow our RNA manufacturing capabilities. We currently have at least 10 local SMEs across the value chain for RNA therapeutics, and NATi will support and grow more local SMEs and startups, and attract more companies here.

- iii. Third, A*STAR will launch MedTech Catapult, a \$38 million initiative to accelerate the development of novel Life Science Tools and Medical Devices, by working with companies and product owners to translate research into commercial products. This initiative will help intermediaries like local contract manufacturing organisations move up the value chain so that they can not only manufacture, but

they can also develop their own MedTech product design and capabilities. Through MedTech Catapult, we also aim to train and to upskill product engineers, who can then go on to serve in the industry.

- iv. Fourth, a new tranche of about \$60 million funding will be provided to the National Robotics Programme, or NRP. Started in 2016, the NRP has delivered good outcomes, such as the development of the Robotics Middleware Framework, that enables different brands of robots to work seamlessly with each other by standardising communications and de-conflicting navigation routes.
 - a. Moving forward, the NRP will step up translation of our robotics R&D capabilities, particularly in sectors such as manufacturing, logistics, facilities management and healthcare. It will do this through “RoboClusters”, bringing together public sector researchers, end-users and robotics companies, to foster collaborations and co-development of solutions with economic potential. NRP will also help to accelerate the growth of promising Singapore-based robotics SMEs and startups.

C5. Ms **Jessica Tan** asked how MTI will grow the talent pool in R&D. Together, the 4 platforms I just mentioned are expected to train over 200 specialised research talent such as product and robotics engineers and research scientists. They will also deliver more than 75 projects, and licence out over 40 technologies, amongst other outcomes.

- i. All these will contribute to the development of an open and inclusive ecosystem where research, innovation and enterprise can come together to create commercially meaningful outcomes for businesses, and help our industry partners to scale up.

Manpower

D1. Third, on manpower. We need to strengthen our workforce competitiveness in tandem with our economic competitiveness.

D2. As Minister Gan shared earlier, we are committed to creating good opportunities for Singaporeans as we grow our economy. To empower Singaporeans to seize these opportunities, our workforce will need to be equipped with the relevant skillsets.

D3. I will share more details in my MOM COS speech on:

- i. MOM's plans to support workers at all levels to enhance their employability, strengthen their career health, and acquire overseas work experience; and
- ii. How the Global Business Leaders Programme (GBLP) mentioned earlier by Minister Gan, will support Singaporean middle to senior Managers with leadership potential, to acquire the relevant overseas work experience and leadership skills to become corporate leaders.

D4. This will complement the bilateral manpower programmes MTI is developing with Indonesia and Vietnam. When launched, the Tech:X programme with Indonesia, and the Innovation Talent Exchange (ITX) programme with Vietnam, will allow Singaporeans to pursue work stints in the areas of technology and innovation in Indonesia or Vietnam respectively, and vice versa. This will support our companies and Singaporeans in tapping on exciting opportunities in our fast-growing region.

Land

E1. Finally, on optimising our scarce land resource.

E2. **Mr Saktiandi Supaat** asked about the Government's efforts in ensuring that we have sufficient land to meet our competing industrial, housing, and recreational needs.

- i. MND will share more on the Government's masterplanning process and how we balance across competing land use needs.

- ii. In planning for industrial estates, JTC seeks to optimise industrial land usage through land intensification and recycling, as well as the siting of industrial uses within mixed-use districts near to housing and recreational facilities.

E3. Our upcoming new industrial districts like Punggol Digital District (PDD) and Jurong Innovation District (JID) are designed to embody this philosophy.

- i. PDD will house the new Singapore Institute of Technology campus alongside digital tech companies to create opportunities for applied learning, and to build a robust pipeline of local tech talent. One of PDD's anchor tenants is UOB, which will be building its 300,000 square foot global technology and innovation centre to house around 3,000 tech talents.
- ii. JID supports Singapore's Manufacturing 2030 ambition to become a global business, innovation, and talent hub for advanced manufacturing. The anchoring of companies alongside A*STAR's Advanced Remanufacturing and Technology Centre (ARTC), which has collaborations with about 100 industry players inclusive of Government agencies, research institutes and academia, will help accelerate innovations to create an advanced manufacturing ecosystem.

E4. JTC will also rejuvenate key industrial estates in Sungei Kadut, Ang Mo Kio and Kallang-Kolam Ayer.

- i. JTC's tenants can look forward to smarter and more sustainable facilities and infrastructure.
- ii. Suitable existing buildings and structures will also be identified for potential adaptive reuse, and will serve as activity nodes for workers and the surrounding community.
- iii. More details will be provided within URA's Draft Master Plan 2025.

Conclusion

F1. Mr Chairman, to conclude, I spoke about how we would unlock potential in the areas of energy and carbon, R&D, manpower and land.

F2. That said, the path forward would not be easy. In fact, it has never been easy for a resource-constrained nation like Singapore.

F3. But as the Chinese saying goes, 时势造英雄, which translates to tough times create not just heroes, but heroines.

i. That has been our story. We were small, with no natural resource endowment.

ii. But together, our people managed to make it work, by carefully optimising whatever resources we have, coupled with human ingenuity and innovation.

F4. With good planning and strong support from businesses and Singaporeans, I am confident we can, and we will, be able to unlock our resource potential, to strive for the next bound of growth. Only in this way can our businesses continue to stay competitive, and bring more opportunities and benefits to Singapore and Singaporeans for many more decades to come.

F5. Thank you.