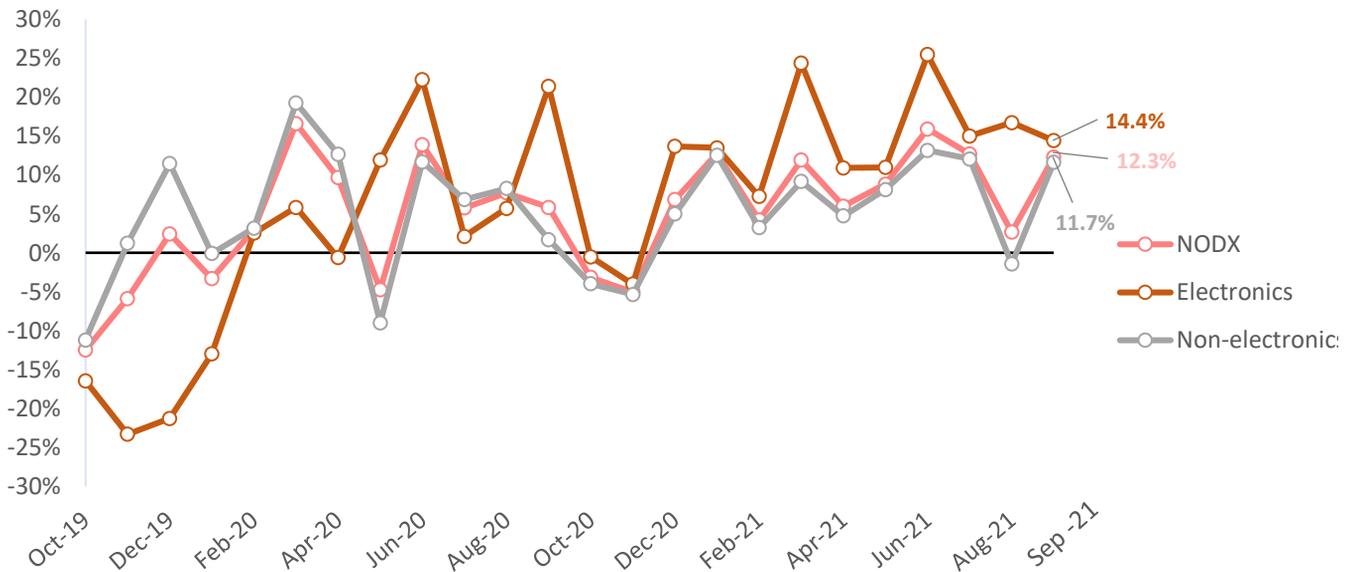


# SEP 2021

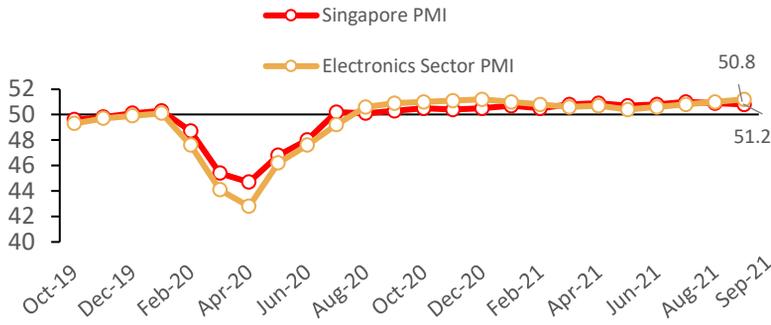
In September, Singapore announced its continued commitment towards its goal of a sustainable nation through various initiatives such as investing more into sustainable projects, encouraging its citizens to lead a greener lifestyle and rolling out higher standards for sustainable infrastructures. With the recovering of the economy, it is noted that indication of inflations can be seen as cost of goods, transport and energy have increased significantly, placing pressure on businesses.

## Non-Oil Domestic Export (NODX)



- Trend:** NODX and non-electronics exports increased (MOM) while electronics exports fell slightly. Growth rate for NODX and non-electronics continue to show positive growth in the last 9 months as the economy recover:
  - NODX rose by 12.3%, an increase from the 2.7% in Aug
  - Electronics rose by 14.4%, a slight decline from the 16.7% in Aug
  - Non-electronics expanded by 11.7%, an increase from the 1.4% contraction in Aug.
- Main contributors to growth (electronics):** PCs, ICs and telecommunications, which expanded by 45.4%, 7.0% and 45.4% respectively
- Main contributors to growth (non-electronics):** Specialised machinery, petrochemicals and pharmaceuticals, which expanded by 34.9%, 52.8% and 27.3% respectively
- Going forward:** NODX to top markets all rose in general, with China, United States and South Korea being the largest contributors to this rise. The robust global demand for semiconductor and ICs has contributed to the growth of NODX, though growth of NODX is likely to be dampened by persistent supply-chain disruptions. For the non-electronics, as China seeks to conserve its fuel and power sources for winter, there is likely to be more demand for petrochemicals from Singapore's oil refineries. The growth of petrochemicals is likely to persist till Q1 2022. Overall, despite setbacks, growth in exports are likely to continue.

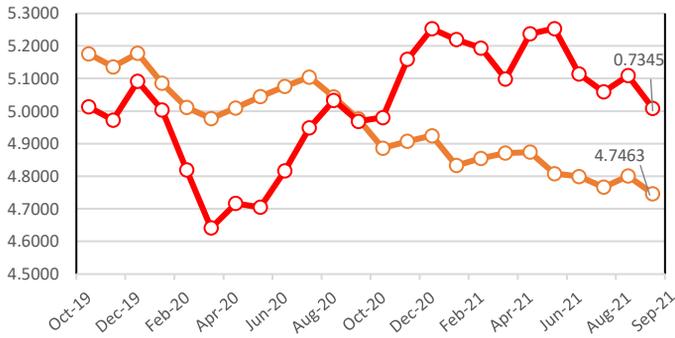
## Purchasing Managers Index (PMI)



- **Trend:** PMI remains stable above the 50-point mark in Sept 2021. However, Singapore PMI decreased from 50.9 in August to 50.8 in September. Electronics PMI increased from August's 51.0 to August's 51.2.
- **Going forward:** With supply chain disruptions continuing, manufacturers have reported slower expansion. As global trade have shown signs of peaking, this trend of slowed growth is likely to continue

## Foreign Exchange Rates (FX)

### SGD/CNY



### SGD/USD

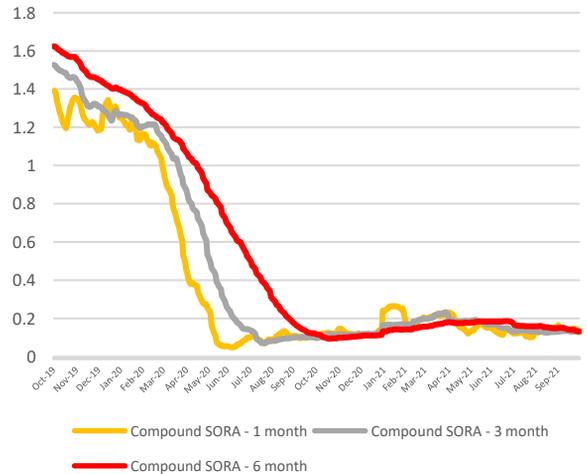
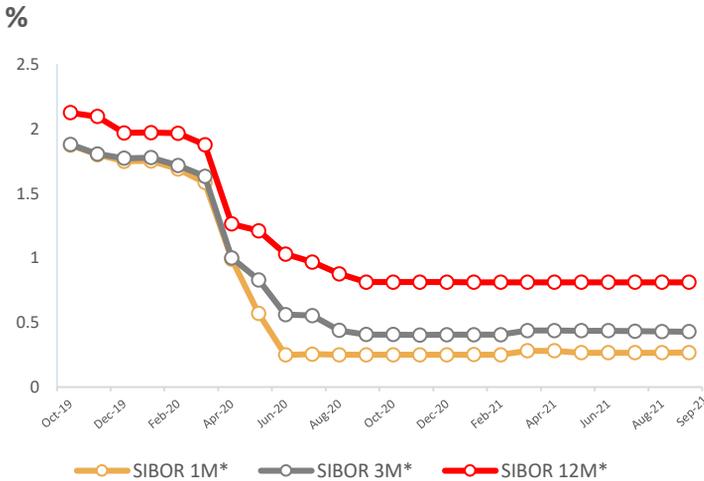
### USD/CNY



- **SGD/USD:** SGD depreciated against USD in Sep 21 (at a rate of 0.7345).
- **SGD/CNY:** SGD depreciated against CNY in Sep 21 (at a rate of 4.7463).
- **USD/CNY:** USD appreciated against CNY in Sep 21 (at a rate of 6.4696).

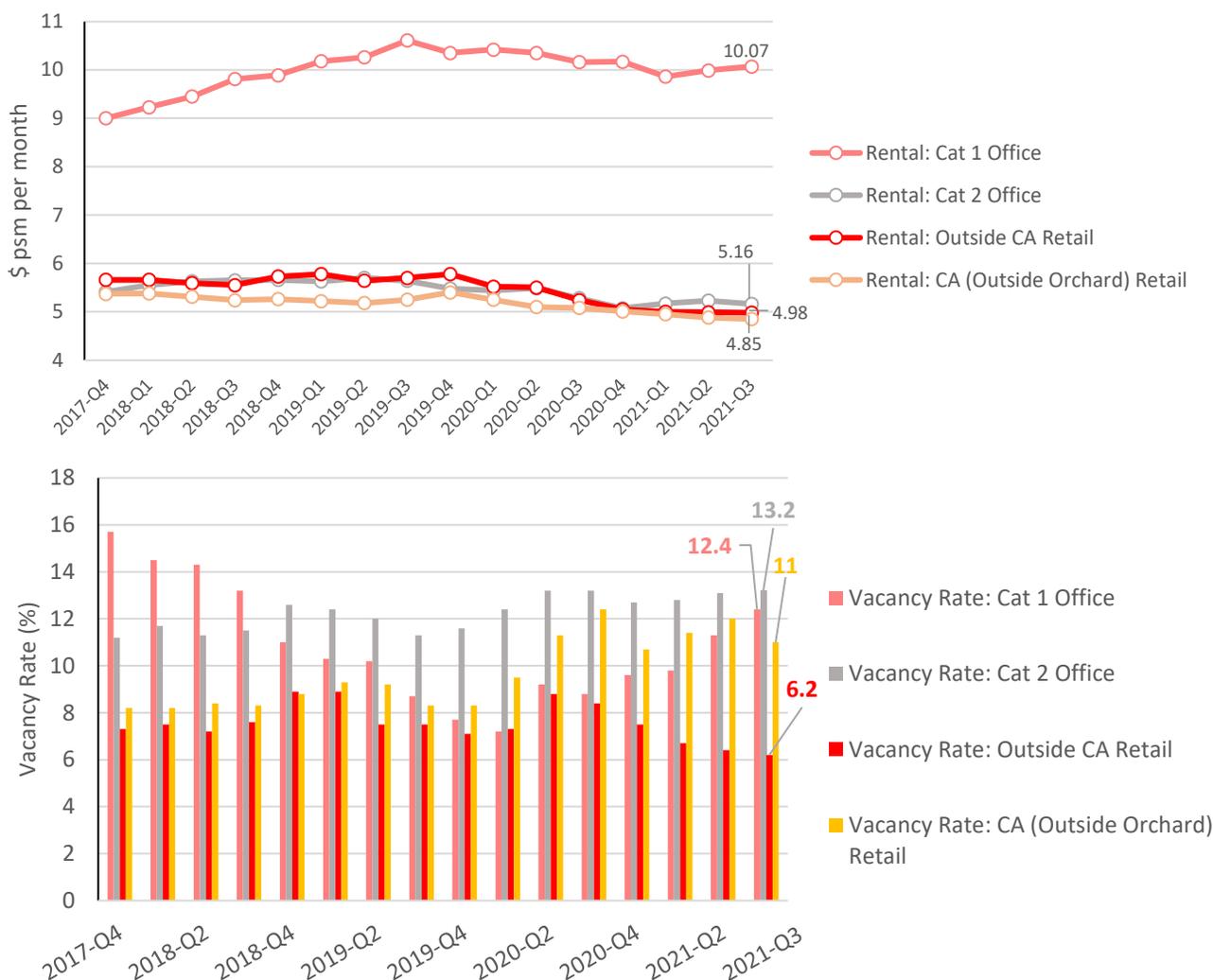
## Singapore Interbank Offered Rate (SIBOR)

## Singapore Overnight Rate Average (SORA)



- **SIBOR Trend:** The 1-month SIBOR, 3-months SIBOR, and the 12-months SIBOR remain stable at 0.267, 0.428, and 0.811 respectively.
- **SORA Trend:** All three compounded SORA rates have fallen slightly below 0.2 range.

## Median Rentals and Vacancy Rates for Offices and Retails



- **Median rental:** Median rental of Cat 1 offices (located in core business areas in Downtown Core and Orchard Planning Area) increased while and Cat 2 offices (localities not included in Cat 1) decrease in Q3. Median rental of retail space in Outside Central Area (CA) and retail space in CA (outside Orchard) median rental both decreased in Q3.
- **Vacancy rate:** The vacancy rate of Cat 1 offices, Cat 2 both increased in Q3. The vacancy rate of CA (Outside Orchard) Retail and Outside CA Retail decreased in Q3.
- **Analysis:** The increasing trend in median rental for office spaces is due to the increase in demand for higher quality offices, primarily from technology firms, financial institutions, healthcare sectors and by co-working operators. By taking up spaces vacated during the pandemic, these firms were able to secure lower rents to expand operations at higher quality office spaces. This flight to quality explains the increase in median rental for Cat 1 offices while rental for Cat 2 offices fell. In addition, the demand for flexible workspaces is also likely to increase in the post-pandemic work environment, as co-working space providers to jump in on the trend. The Executive Centre and The Great Room, co-working operators, have opened flexible workplaces in Central Business District (CBD) which are 38,736 sq ft and 37,000 sq ft respectively. Despite increase in demand for Category 1 offices, however, vacancy rates of these offices continue to rise as the supply continue to increase. JLL expects rents of Cat 1 to increase by 23% to 30% by 2025, especially with older buildings being converted into mixed-use developments in the future, reducing the supply of office space.
- The decrease in the vacancy rate of retail spaces could be due to the gradual opening of border and Singapore's transition towards living with Covid-19 as an endemic. With life going back to normal as well as the potential influx of tourist, this is likely to encourage demand for retail spaces.



- **Overview:** The forecast for expected GDP has been raised to 6.6%, compared to the 6.5% back in June. The reasons for the expectation increment can be mainly attributed to the reopening of borders to international travel. Other reasons include stronger manufacturing growth and effective policies containing the Covid-19 outbreak. However, putting a damper on this optimism is the worsening Covid-19 outbreak and the tightening of restrictions. This could result in supply-chain distribution. On a year-on-year basis, Singapore's economy grew by 0.8% in Q3, a fall by 1.4% from Q2.

#### **Growth by Sector\*:**

- 1) Manufacturing – grew by 7.5% year on year
- 2) Construction – grew by 57.9% year on year
- 3) Wholesale trade sector – grew by 5.0% year on year
- 4) Retail trade sector - grew by 5.0% year on year
- 5) Transportation and storage sector - grew by 5.0 % year on year
- 6) Accommodation sector - grew by 3.1% year on year
- 7) Food and Beverages - grew by 3.1% year on year
- 8) Information and Communications sector - grew by 7.7% year on year
- 9) Finance and Insurance sector - grew by 7.7% year on year
- 10) Real estate sector - grew by 3.1% year on year
- 11) Professional services sector - grew by 7.7% year on year
- 12) Administrative and support services – grew by 3.1% year on year

#### **\*Data taken from Ministry of Trade and Industry Singapore**

Source: <https://www.singstat.gov.sg/media/files/news/advvgdp3q2021.pdf#:~:text=Based%20on%20advance%20estimates1%2C%20the,growth%20in%20the%20previous%20quarter2>

While some level of growth was experienced in Q3, Q4's business sentiments for construction and transport remains pessimistic overall. While sentiments for the construction sector have improved, the three key indicators (sales, net profit and inventory) remained low. Similarly, for transportation, these indicators were negative. Meanwhile, for financial and manufacturing sector, sentiments remain positive. The overall Business Optimism Index (BOI) increased by 5.78%.

Retail sales is also likely to recover, with several segments (eg. Food, alcohol, jewellery) observing a year-on-year increase in July.

Inflation is expected to be at 1.7% while core inflation is expected to be at 0.7%. Core inflation is a measure that 'excludes transitory or temporary price volatility as in the case of some commodities such as food items, energy products etc. It reflects the inflation trend in an economy.'

*\*Quoted from Economic Times*



# BUSINESS ENVIRONMENT

- **Rental:** Eligible small and medium-sized enterprise (SMEs) as well as non-profit organisations will receive a two-week rental waiver provided by commercial landlords.

**To be eligible for the Rental waiver, the tenant must fulfil the below criteria\*:**

- a) Tenant of qualifying commercial property
- b) Annual revenue not exceeding \$100 million in FY2019
- c) Lease/licence must be a) Renewed /Entered before 20 Jul 2021 and b) In force for the entire period from 5 August to 18 August 2021 (both dates inclusive)
- d) Suffered at least a 20% drop in average monthly revenue during both Phase 2 (Heightened Alert) periods, as compared to the Phase 3

For more information of policy: <https://www.mlaw.gov.sg/covid19-relief/rental-waiver-framework-2021>

*\*Quoted from minlaw*

The rental framework is complemented by other measures such as the Rental Support scheme, to ease the impact of Phase 2 on businesses and employees. In total, tenants that qualify will receive up to 1½ months of rental support.

- **Electricity Bill:** The increased cost of electricity is due to price increase of fuel for electricity generation. Singapore relies heavily on natural gas for electricity generation, with more than 95% of the energy needed being met by natural gas. Globally, the demand for natural gas has rebounded, causing price increase for natural gas. Regulated household tariffs are also another contributing factor to the rising electricity prices, with tariffs reaching 25.02 cents/per kwh in Q3, compared to 24.13 cents /per kwh. Other factors that contribute would be the maintenance of power generation plans and unplanned outages to generation company. Electricity pricing plans for households has gone up around 10-20%, compared to prices in June. Higher electricity prices for Singapore households are likely to be here to stay.

- **Aviation in Singapore:** Singapore Airlines (SIA) and Changi Airport was recently crowned the winner of Future of Travel Awards held by Newsweek, overtaking other finalists such as Air France, Emirates and Qatar. The success can be attributed to SIA's decision to invest in renewable and sustainable sources of energy, using more efficient aircrafts, using produce from local farms as well as the commitment to lower carbon emissions to net zero by 2050. Other reasons include ensuring health of travellers and having sustainable operations.

- **Singapore Convention on Mediation:** The Singapore Convention on Mediation is a multilateral treaty that facilitates international trade and commerce through providing a framework for mediating international disputes and invoke international settlement. As Covid-19 continues to affect our way of life, some businesses are not able to fulfil contractual obligations. Furthermore, with political instability and civil unrest across the globe, markets are becoming increasingly fractured and volatile, worsening the commercial risks that businesses must take on. Amidst this tumultuous events and environment, Singapore Convention on Mediation allows for mediated agreements to be enforced in countries involved. A settlement agreement made in one country without the treaty would mean that it is not legally binding in another, and both parties would need to go to court to enforce the settlement.



- **Tuas Mega Port:** In efforts to raise its status as a shipping hub, Singapore has invested in port infrastructure, with the Tuas mega port being a major achievement in this long-term goal. The first two berths of the Mega Tuas Port are set to be open by the end of the year. High tech port equipment such as automated rail mounted gantry cranes and automated guided vehicles have reached the port and are under testing. The Tuas port is projected to complete in 2040, and it will be the largest automated terminal in the world with the ability to handle up to 65 million 24-foot equivalent units (TUS) annually. The strategic location of Singapore, coupled with the infrastructure upgrades in the port, is likely to benefit the manufacturing, logistics, supply chain and maritime industry.



- Singapore Exchange (SGX) have allowed for listing of Special Purpose Acquisition Company (SPAC), rolling out the framework and rules. Spac refers to a shell company made up of a group of investors that raise funds through initial public offering (IPO) and purchase an existing company. This process tends to be a lot quicker than traditional IPO. After funds are raised, the investors have a limited time to 'de-spac' – to merge with/acquire a company of choice.

**The following conditions must be met for a Spac listing to go through\*:**

1. Minimum market capitalisation of S\$150 million
2. De-SPAC must take place within 24 months of IPO
3. Moratorium on Sponsors' shares from IPO to de-SPAC, a 6-month moratorium after de-SPAC and for applicable resulting issuers, a further 6-month moratorium thereafter on 50% of shareholdings.
4. Sponsors must subscribe to at least 2.5% to 3.5% of the IPO shares/units/warrants
5. De-SPAC can proceed when > 50% of independent directors and shareholders supporting the transaction
6. Warrants issued to shareholders will be detachable and maximum percentage dilution to shareholders arising from the conversion of warrants issued at IPO is capped at 50%
7. All independent shareholders are entitled to redemption rights
8. Sponsor's promote limit of up to 20% of issued shares at IPO

Bullet points quoted from SGX

\*For more information: <https://www.sgx.com/media-centre/20210902-sgx-introduces-spac-listing-framework>

As Spac listing is rather new, Securities Investors Association (Singapore) will be providing independent research on de-Spacs to offer investors guidance in the voting of merger with company of choice. In lieu of the new Spac listing framework, plans to raise \$300 million of funds for Tikehau Capital are also in the making. While the company has not identified the specific sector for its prospective Spac firm, the company is prepared to file for an IPO for its Spac.

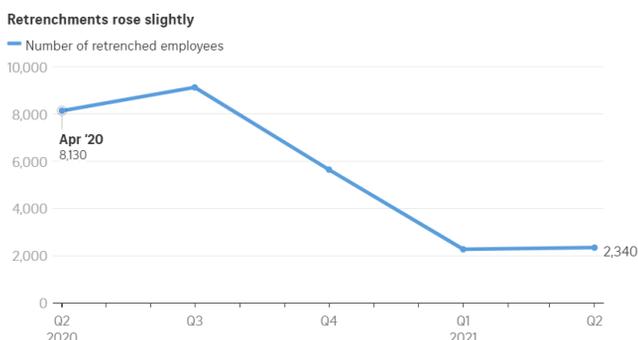
- **Funding for start-ups in Singapore:** As the global economy continues to recover, start-ups, especially those in the healthcare, tech and e-commerce industries are benefiting from the investment that goes into these industries. In the case of healthcare, the pandemic has driven the demand for telehealth providers, with Doctor Anywhere raising S\$88 million of funds. Other healthcare providers, such as Homage (healthcare service) raised S\$40.3 million while Intellect, a mental health firm had US\$2.2 million of firms. The tech industry also raised S\$5.3 billion in the first six months of the year, adding server unicorns to its list. Rainforest, an e-commerce brand has also received US\$20 million of funds from Monk Hill Ventures. In logistics, Ninja Van have also raised S\$783 million in total, bringing its company's valuations beyond US\$1 billion.



# LABOUR MARKET

- Overview of labour market:** As Covid-19 restrictions tightened, retrenchment rates increased to 2,340 in Q2. However, the number of layoffs were still within pre-pandemic range in 2018 and 2019. Manufacturing and construction contributed to the rising retrenchment rates. On the other hand, despite stricter measures in phase two where dine-in was not allowed and social gathering was limited to two people, retrenchment rates for industries such as food and beverages (F&B), retail trade and arts, entertainments and recreation fell. This could be possibly attributed to the underemployment of these workers, with them being placed on shorter work weeks or being laid off temporarily.

- Overall, seasonally adjusted unemployment rate was at 2.7%, an improvement from September 2020 where unemployment rates peaked. As border restrictions ease and the economy recovery continues, employment rates would likely be reduced. However, labour market recovery is likely to be uneven due to uncertainties in the external economic environment.



**Fig 1: Retrenchment rate**  
Source: Straits Times

- Upskilling workers:** A research institute – known as the Asian Institute of Digital Finance – will be launched in NUS. It is an additional pipeline used to nurture talents for the fintech industry, aimed to equip its students with knowledge in computing technology, data analytics, intelligence systems, digital financial transactions and risk management. With Singapore being the first country to launch digital banking licenses in Southeast Asia, a productive and skilled set of manpower in this industry is required. The Fintech industry is now gaining traction, with the digital economy expected to hit US\$300 billion by 2025.

In 2016, TUV SUB, a global testing and certification giant, had invested \$40 million to build a Digital Centre of Excellence, aimed at developing talents and technologies. This centre will be located at the new \$100 million regional hub that TUV SUD have recently build to explore and test various technologies. A partnership between TUV SUD and ComfortDelGro Engineering has also been announced, with them jointly developing a training programme to equip automotive technicians with the necessary knowledge on how to handle high voltage systems in electric and hybrid vehicles safely. Singapore, according to TUV SUB, was chosen as a destination given its “pro-business environment and skilled talent pool”. The DBS Hack2Hire hackathon will also be held, and through this initiative, DBS Bank will hire 150 people to fill technology roles as they aim to increase their use of AI, block chain technologies and machine learning. This will also contribute to Singapore’s aim of nurturing more talent in the fintech industry.

**More funds for training adults with disabilities:** A \$4 million fund by Temasek Trust and the five Community Development Councils (CDCs) is available to adults with disabilities that wish to go for training or upskill. The fund – known as CDC Lifelong Enabling Fund – will go through SG Enable, subsidizing \$1,000 - \$4,000 of the course-related fees or devices that support learning. The aim of this fund is to close the learning gap with those with disabilities. Those with disabilities will be eligible if they are a) above 18, b) not enrolled in special education schools or mainstream schools and c) Singapore citizens or permanent residents. Those eligible can apply for the fund more than once, with amount capped at \$1,000.

**New training centre for those in the agri-tech sector:** A new six-month training programme led by the National Trades Union Congress (NTUC) learning hub will equip trainees with the basic skillset of growing crops, farming technology, automation and business and farm operations. Use of AI and machine learning in farming operations will also be taught to them. A monthly allowance of S\$1,200 will be given to the trainees. The programme costs \$17,880, however, for eligible Singapore citizens and permanent residents, it will be \$500 (which can be further waived with the use of SkillsFuture credits).



# MANUFACTURING & TECHNOLOGY

- **Use of technology - Transport:** Five MRT interchange stations, namely Outram Park, Chinatown, Dhoby Ghaut, Little India and Serangoon, will be rolling out a video analytics system developed by Thales, to detect unmasked individuals and any unattended luggage. The goal is to enhance safety and security, as well as commuters experience when taking public transport. Currently, SMRT staff must regularly patrol MRT stations and monitor CCTV cameras to identify any issue, taking the staff away from other work like assisting the commuters. This system will cut down on the time needed to identify issues such as unmasked commuters – an important aspect as Covid-19 cases is on the rise. Furthermore, the system can help to accurately determine passenger density, which will help staff determine if more bridging buses or marshals are required in the case of MRT breakdowns.
- **Use of technology – Security:** Autonomous robot, Xavier, is also on a three-week trial in Toa Payoh neighbourhood where they will patrol the streets to identify smokers smoking in prohibited areas, illegal hawkers, social gatherings that are over the limit and motorcycles and e-scooter riders on pedestrian pathways. These robots are equipped cameras that can see 360-degrees and in the dark. When undesirable social activities have been identified, Xavier will broadcast a pre-recorded warning message. Any offences will also be alerted to the officers in real time. Xavier is developed by Home Team Science and Technology Agency (HTX), in partnership with Agency for Science, Technology and Research, with five agencies being jointly involved in this venture. The government agencies are: HTX, National Environment Agency (NEA), Land Transport Authority (LTA), Singapore Food Agency and Housing Board. The use of Xavier will reduce manpower requirements for patrols and improve operational efficiency.
- **Use of technology – Logistics:** xSquare, a subsidiary of Goldbell – a local engineering and transport group – has been producing autonomous forklifts for an international logistic company Katoen Natie currently located in Singapore. The price of the autonomous forklifts starts from about \$130,000 and lasts for seven to eight years. With a 90-minute charge, the forklifts, which run on lithium batteries are able to last for 12 hours. As these machines are equipped with a Lidar, barcode readers and height sensors, they do not require human intervention to operate thus able to replace up to six workers with the use each forklift. Other clients of Goldbell subsidiary include pharmaceutical company GlaxoSmithKline, furniture maker Star Furniture and vertical farming firm Packet Greens. These warehouses are likely to fully automate in the future.
- **Use of technology – Healthcare:** Technology has also made consultations much clearer and complicated procedures more accurate, less risky and faster. 3D printing allows doctors at Tan Tock Seng Hospital (TTSH) to print mock-up of patient body parts for clearer consultation and surgical templates. These surgical templates can be hard to find for complex operations, and custom orders of these templates are not only expensive but also time-consuming. In-house 3D printing can create these templates in a few hours, shortening waiting time for some operations.
- **More funding for construction firms adopting robotics and automation:** SME and larger construction firms that face manpower shortages for extended periods of time are now able to get up to 80% funding for the adoption of robotics and automation solutions. The Integrated Robotics and Automation Solutions initiative is a joint venture by the Infocomm Media Development Authority and Building and Construction Authority (BCA) in their efforts to reduce reliance on low-skilled manpower, boost productivity and raise worksite safety.

# DIGITAL CONNECTIVITY & INNOVATION

- **Digital life in Singapore:** Globally, Singapore is ranked 6th in terms of digital quality index – an index that measures a country in terms of Internet affordability and quality, cyber security, digital infrastructure, and electronic government and highlights areas of improvement.

Internet affordability and quality: In terms of quality, Singapore came in 13th globally, having the fastest broadband internet speed (230.22Mbps) with a very stable network. For affordability, Singapore ranked 15th, being 60% more affordable than world average. Internet is also highly accessible, with those in Singapore needed to only work on average 1h and 17 min for the cheapest broadband internet package. This is in comparison to the 6-hour global average. Cyber security: One of the aspects that improve the most given the tightening of data protection laws. Digital infrastructure: The annual improvements made to broadband and mobile Internet speeds had plateaued. Electric government: Ranked at 5th place given the government's readiness to use AI and based on online services provided.

**Top 10 countries in the Digital Quality of Life index**

	2021	2020
Denmark	1	1
South Korea	2	NA
Finland	3	11
Israel	4	8
United States	5	22
<b>Singapore</b>	<b>6</b>	<b>12</b>
France	7	4
Switzerland	8	15
Germany	9	16
Britain	10	7

**Fig 2: Ranking of digital quality amongst countries**

*Source: Straits Times*

- **Launch of new cloud gaming services for a better gaming experience:** Starhub, a telco in Singapore, has recently launched a new cloud gaming service called GeForce now, allowing gamers to play heavy gaming apps without expensive game consoles or the latest device. Even a mobile phone or laptop with limited processing capabilities can now play over 1,000 games that is compatible with cloud gaming service. A user can pay \$19.99/per month or \$199.90/per year to enjoy cloud gaming services. However, the user must buy digital games separately. GeForce Now also requires at least 15Mbps and 25Mbps connection for games at 1080p resolution at the same frame rate. While 4G connection suffice for streaming, a 5G connection is 10 times faster. Currently, 5G networks only cover about 50% of the nation, however.
- **SingPass as a universal digital ID:** SingPass is a government backed authentication system. The use of SingPass to authenticate online access of consumers by private sectors are on the rise, with a 50% increase from March 2021. Insurance agents have used it as a means to authentic personal details for application processing and OCBC, a bank in Singapore, have offered Singpass as an alternative login in method to access digital banking services.

- **Digital Payment System:** Plans to link Singapore's PayNow (where individuals are able to transfer money using their mobile number) with India's Unified Payments Interface (UPI) real-time payment system have been announced by Monetary Authority of Singapore (MAS) and the Reserve Bank of India. Consumers are now able to transfer money between their e-wallets and such connectivity between PayNow and UPI marks a major milestone in cross-border payments between the two countries. MAS and Bank of Thailand has also announced a similar collaboration back in April 2021, with PayNow linking up to Thailand's PromptPay. This tie-up allows consumers to transfer up to \$1,000 or 25,000 baht (S\$1,019) across the two countries daily with the use of their mobile phones. Closer to home, PayNow will also be linking up with Malaysia's DuitNow real-time payment. The tie-up between the two is likely to begin at the later end of 2022, facilitating and accelerating cross border remittances and payments for those travelling from the two countries. The partnerships are in line with the Group of 20's (G20) goal of having 'faster, cheaper, and more inclusive and transparent cross-border payments', forming an ASEAN network for real-time payment systems.

The tie-ups between PayNow and real-time payment service in other countries have resulted in a more competitive cross-border payment scene. Companies in the cross-border payment industry are finding ways to enhance their remittance services to stay competitive. Instarem, an arm of fintech unicorn Nium, have launched its amaze card in partnership with Mastercard. The card allows users to pair up to five debit/credit cards to it and has additional cashback and lower foreign transaction. Revolut Singapore chief has also noted that the fees are 0.3%, comparing to PayNow PromptPay's 3-5%. PayNow system prioritise speed of transferring while the rest of the providers focus on currency conversion and minimizing transaction costs.

Fomo Pay, a fintech company in Singapore, been given licences to run three new regulated activities, joining other payment apps in the scene. Fomo pay would now be able to accept and process payment transactions, carry out money transfer services within Singapore and facilitate transactions using digital payment tokens. Fomo works with over 10,000 merchants, with its cilents coming from various industries such as retail, F&B and e-commerce.

As digital payments, internet banking and AXS machines become more popular, cheques are increasing become obsolete: Cheque transactions at DBS are likely to fall by 20% compared to 2020. The number of digital payments are also on the rise, with it being 300 times higher than cheque transaction. Similarly, there is too a fall in cheque transactions for corporations, with banks witnessing a 50% fall in cheque use.

- **Legal changes in the digital realm:** Changes to the Copyright Act will be granting rights of photos taken in a wedding to the photographer. The changes are expected to take place in November, giving creators the same rights as the commissioner – who are entitled to the copyright ownership right from the start. This change is in line with to move that will make creators of portraits, films, sound recording and engravings the default owners of their creations, even if the pieces are commissioned.

A Foreign Interference (Countermeasures) Bill was also introduced, granting the minister powers to block content from social media platforms if deemed to be part of a hostile information campaign. Directions can also be issued to various entities such as associated services (ie. Social media, electronic services, internet access services) as well as individuals that manage these blogs, websites and pages. The main aim of this bill is to help authorities investigate and take measures against hostile foreign communications activities, not to silence Singaporeans expressing their political views. If the following conditions are met, directions of proposed law can be issued\*:

- 1) Communications activity is taking place or has taken place
- 2) The activity is conducted by or on behalf of foreign actors
- 3) There is information published here resulting from the communications
- 4) The Minister of Home Affairs assesses it is in the public interest to authorise these directions

*\*Points quoted from Straits Times*

Other powers granted include having the right to get service providers to disclose information required for authorities to see if there are any foreign actors behind any hostile communication activities.

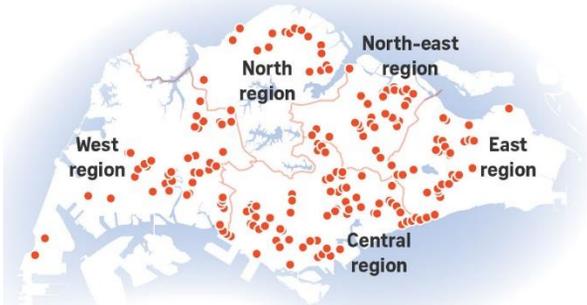
# TRANSPORTATION

- Transport system improvement:** Land Transport Authority (LTA) is exploring ways to build a more resilient and robust transport system. Some of the initiatives to achieve this aim are: launching an innovation call known as Accelerating Co-Innovation for Transformation and Export which aims to find solutions and increase productivity in transport through the use of AI and automation; the revision of national standards such as Technical Reference 68 (TR 68), which will regulate the development of autonomous vehicles; equipping the workers with skills required to keep up with this changing industry through establishing new courses such as for the urban railway technology.
- Greener modes of transport:** Approximately 600 EV chargers will be installed across the island, making usage of electric vehicles more accessible. This is in lieu of the nation's plan of installing 40,000 EV charging points by 2040. The EV chargers will be installed at public carparks in HDB estates, Central Business Districts and Industrial estates.

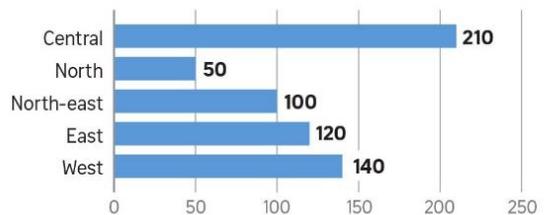
## Powering up electric vehicles

By September next year, users of electric vehicles will be able to tap 620 charging points at more than 200 public carparks across the island.

### WHERE THE PARTICIPATING CARPARKS ARE



### NUMBER OF CHARGING POINTS



### AREAS/OPERATORS

<b>Central, east and west</b>	• ComfortDelGro Engineering
	• Engie South East Asia
<b>North and north-east</b>	• Primech A&P
	• Charge+
	• Sunseap Group
	• Oyika

**Fig 3: Distribution of EV chargers**

Source: Straits Times

The distribution of the charging points will be as such: 210 in the central region, 50 north, 100 north-east, 120 in the east and 140 in the west. ComfortDelGro Engineering and Engie South East Asia will be installing EV chargers in the central, east and west while Primech A&P, Charge +, Sunseap Group and Oyika will be setting up infrastructure in north and north-east areas. Concession fees ranging from \$0.108/kWh and \$0.154/kWh to the Government by the companies for the right to operate and deploy charging points. The types of chargers that would be deployed would be 22kW AC chargers, 279 kW AC chargers and 50kW DC chargers.

However, challenges remain for the installation of EV chargers in private properties such as private properties and condominiums. This is due to unwillingness from the residents in the allocation of parking lots for EV charging, lack of demand of EVs chargers from resident and the uncertainty in who should bear the cost. In response to this, the government has rolled out the EV Common Charger Grant (ECCG), where the installation cost of approximate 2,000 EVs at non-landed private residences will be 50% co-funded by the ECCG. This is to encourage installation of EVs in NLPRs and reduce costs.

Shell is also offering electric ferry service in 2023 between Pulau Bukom and Singapore. At least three of the electric ferries will be constructed by Penguin International, a Singapore-based boat builder. The electric boat will run on a 1.2 MWh lithium-ion battery, allowing for zero on-site emission with little audible noise. The project is estimated to cost around S\$2 million per vessel, with reference from a Thai project using similar ferries.

Shell has also announced that hydrogen fuel cell ships will be trailed in Singapore. These ships are powered by hydrogen with the aid of electricity.



# SUSTAINABILITY

- **Launch of carbon credit marketplace:** A digital platform meant for trading carbon credits will be launched with the collaborative effort of Singapore and the Climate Impact X (CIX) players (Singapore Exchange, DBS, Standard Charter, and Temasek) as Singapore looks to increase trade of carbon credits. The platform will cater to buyers such as MNCs and institutional investors. This is in part of the nation's effort to develop an ecosystem to encourage decarbonisation and an international carbon trading marketplace.

- **Buildings in Singapore now required to meet higher sustainable standards:** Changes have been made to the Building and Construction Authority (BCA) Green Mark Scheme, requiring higher sustainability standards for buildings to be certified green as buildings now require a lower embodied carbon. The buildings will be evaluated based on the following factors: a) Intelligence (use of digital technologies) b) Health and wellbeing whether building design considered the physical, mental and social well-being of its residents), c) Whole life carbon (the amount of carbon emissions resulting from the building's production, including embodied carbon), d) Maintainability (the degree of labour efficiency and cost effectiveness when it comes to down-stream maintenance regimes) e) Resilience (the building's ability to adapt to climate change and stay resilient and if it is able to protect, manage or restore ecosystems). The BCA Green Mark is a rating system that assess a building's performance and environmental impact. This scheme refinement will also be applied to buildings that have already attained to Green Mark.

- **More sustainable businesses:** Takeda Pharmaceutical has also invested S\$19 million on expanding its manufacturing site in Woodlands. The building is a zero-emission building that closely follows the standards set by Singapore Building Construction Authority's (BCA) Green Mark certification scheme. This is in line with the Singapore Green Plan 2030, where one of the goals is to achieve having 80% of the buildings in Singapore green.

Epson's South-east Asia headquarters have also come up with solutions that encourage sustainability. One of the solutions displayed is a dry office paper making system, otherwise known as the Epson PaperLab. Business can recycle wastepaper, making new paper with this product. Through the proposed solutions, clients can lower their carbon footprint. As the need to address climate change becomes increasingly pressing, it is imperative for businesses to find ways to remain sustainable, be it through transforming their business models or finding more solutions

- **US\$150 million to fund sustainable infrastructure projects:** Temasek and HSBC has jointly set up a debt financing platform to help fund sustainable infrastructure projects in South-east Asia and will be investing up to S\$203.5 million dollars. Partnering with Asian Development Bank and Clifford Capital Holdings, this initiative is meant to address the present funding gap for sustainable infrastructure in Asia. The long-term goal of this initiative is to have a pipeline of projects to scale, aiming to loan out over US\$1 billion within 5 years. Funds will be channelled towards renewable resources and storage, sustainable transport, and water and waste treatment. This is in efforts to reduce carbon emission to meet targets and offset the environmental damage.

- **Launch of new course to bridge knowledge gap:** The disposal of refrigerants, if not done properly, can release 1,300kg of carbon dioxide per kilogram of refrigerant, causing great harm to the environment. The refrigerant in industrial chiller amounts to 300kg – 1,000kg. Temasek Polytechnic, in efforts to bridge the knowledge gap, is launching a short course to train technics. NEA has also worked with Institute of Technical Education to train technicians for household air-conditioner.

The Environmental Protection and Management Bill has also mandated that the recovered refrigerants must be sent to a licensed toxic waste industrial collector for proper disposal. Some of the toxic waste industrial collectors includes Aroma Chemical Pte Ltd, Chem-Sov Technologies Pte Ltd and Cramoil Chemical Corporation Pte Ltd. Any servicing work that involves the recovering or handling of refrigerant must also be done under the supervision of a certified technician.

For more information on the list of toxic waste industrial collector: [https://www.nea.gov.sg/docs/default-source/our-services/pollution-control/hazardous-waste/list-of-tiw-collectors-\(14-sep-2021\).pdf](https://www.nea.gov.sg/docs/default-source/our-services/pollution-control/hazardous-waste/list-of-tiw-collectors-(14-sep-2021).pdf)

# INFRASTRUCTURE

- **Supply Singapore's electricity use:** Plans to supply 15% of Singapore's electricity needs are now in motion with Indonesia's approval of the subsea cable route that runs through Indonesia's waters (refer to Fig 4.0). The Sun Cable project cost S\$29.5 billion and will supply green energy to Singapore through the 4,200km subsea cable. The Australian company also has plans to invest S\$3.4 billion in Indonesia. This investment will be part of the Australia-Asia PowerLink Project. While no green energy would be supplied to Indonesia, the country will receive US\$1 billion in direct investments (for equipment and services procurement) and another US\$1.5 billion for operational spending (eg. Marine repair base). Singapore carbon emission is likely to be reduced by six million tonnes per annum with 15% of its electricity being supplied by Sun Cable. Importing more green energy from Malaysia is also in the plans as Singapore looks to run on renewable energy. As of now, Singapore depends heavily on gas for energy generation.

Australian company Sun Cable is aiming to meet up to 15 per cent of Singapore's power needs by tapping the vast solar resources of the Northern Territory and transporting the energy via subsea cables.

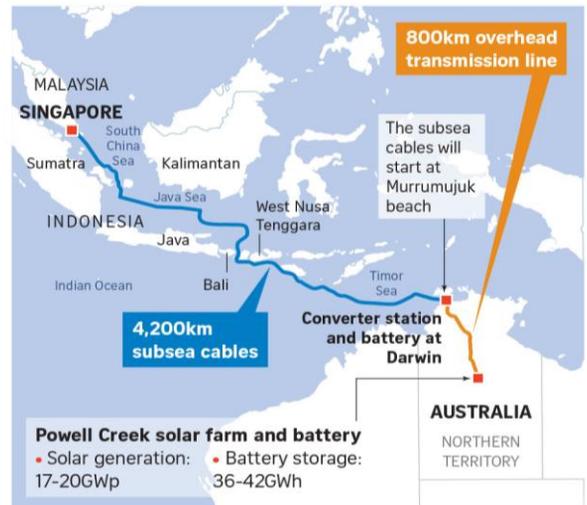


Fig 4: Route of sea cable

Source: Straits Times

- **Sale of Singa Bonds to finance green infrastructure:** The Monetary Authority of Singapore (MAS) will be selling Singa Bonds to raise S\$2.6 billion to fund infrastructure. Retail investors can buy the bonds through ATMs (eg. DBS/POSB, OCBC and UOB ATMs), internet banking portals or OCBC mobile app with a \$1,000 minimum and a Central Depository (CDP) account. This is the first bond to be issued under the Significant Infrastructure Government Act (Singa). Singa was introduced back in April, allowing the government to borrow up to \$90 billion to fund infrastructure that is critical for Singapore's long-term development or for projects that increase national productivity. Singapore Government Securities (SGS) bonds will be issues as a means to develop domestic debt market and meet the retirement needs of Singapore citizens. Plans to issue Green SGS bonds are also in the making, as a means to finance infrastructure that would offset the impact of climate change.

# SUSTAINABILITY

- **Use of disruptive technologies for farming:** The pandemic has affected global supply chains – including food – causing a delay in shipments for many countries. Furthermore, workers were unable to go to farms, leaving crops and livestock to die. Thus, Covid-19 has made switching to an Agri Tech 4.0 a pressing need. Agritech 4.0 can be defined by three components: the use of big data, Internet of things (IoT) and using disruptive and sustainable farming technologies. Land-scarce Singapore, in efforts to become more food secure, has also aimed to leverage on Agritech 4.0 farms. The government has rolled out a \$60 million Agri-Food Cluster Transformation Fund to encourage local farms to adopt robotics and automation, as well as improve their farm operational system. Thus far, Singapore Food Agency (SFA) has awarded more than \$23 million to fund projects under the Singapore Food Story R&D Programme grant call. A new food safety hub that aims to study food safety has also been launched in Nanyang Technological University (NTU) back in April.

- **Lab-grown food in Singapore:** Alternative ways of protein are becoming increasingly popular as concerns over greenhouse gas emissions by rearing livestock grow. Globally, a total of S\$4.1 billion was invested into the development of alternative proteins last year. These alternative proteins are inclusive of both cultured meat and plant-based protein. Cultured meat, refers to “meat products that are made from growing animal cells in a bioreactor”\*, where the cells of these animals are obtained through biopsy or other methods

Chinese firm Avant has announced the opening a facility that will cultivate fish cells by 2022. The facility will be accompanied by a research lab by Agency for Science, Technology and Research (A\*Star)'s Bioprocessing Technology Institute and Avant, which will research on methods to beef up the production of cultivated fish in Singapore.

Another company, Eat Just, a California start-up, has now begun operations in Singapore to sell cell-cultured chicken. It is one of the first companies to be given approval for the sales of lab-grown meat. Globally, SFA was the first authority to authorize the sales of cultured meat product Eat Just's Good Meat back in December 2020. In Singapore, before cultured meat products are permitted for sale, the producing firms must first submit the safety assessments of their products to SFA for review. Currently, over 15 start-ups producing alternative proteins have established a base in Singapore.

*\*Quoted from Straits Times*

- **Community farms:** Sustainability@ Tampines Park is an initiative by the community that consists of vertical high-tech vegetable farm, a tilapia fish farm and a black soldier fly facility, creating a circular ecosystem. Food waste contributed by residents will be broken down by the black soldier fly larvae into fertiliser, which can be used for the vegetables. The insect larvae will then be fed to the fishes. This initiative was launched in cooperation with SFA, Town Council, Otolith Enrichment and Tampines Resident Networks, with the goal of producing more local food in Singapore. This initiative is to be rolled out in other parts of the town, with Tampines reaching the objective of becoming a model Eco-Town by 2025.

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