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VARIO-MISSIE SINGAPORE

**BEKNOPT VERSLAG
&
LESSONS LEARNED**

4-11 MAART 2023
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De Vlaamse Adviesraad voor Innoveren en Ondernemen (VARIO) adviseert de Vlaamse Regering en het Vlaams Parlement over het wetenschaps-, technologie-, innovatie-, industrie-, en ondernemersschapsbeleid. De raad doet dit zowel op eigen initiatief als op vraag. VARIO werd bij besluit opgericht door de Vlaamse Regering op 14 oktober 2016. VARIO werkt onafhankelijk van de Vlaamse Regering en de partijen in het werkveld. De voorzitter en de negen leden van VARIO zetelen in eigen naam:

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BEKNOPT VERSLAG

Singapore staat bekend als een stadstaat met een heel stabiele en betrouwbare overheid. Sinds zijn onafhankelijkheid in 1965 wist het zich op te werken tot een van de meest welvarende landen ter wereld. Het land scoort hoog op allerlei internationale rankings waaronder de PISA scores¹, lage corruptie², ‘ease of doing business’³, hoge FDI⁴, menselijk kapitaal⁵. Door zijn kleine landoppervlak en beperkte natuurlijke rijkdommen heeft men er zich meester gemaakt in het excellent omgaan met schaarste: elektriciteit, water, landgebruik, talent. Door zijn centrale ligging is het bovendien een toegangspoort tot Zuidoost Azië nabij allerlei low-cost landen en tegelijk grote markten met een vrij grote en sterk groeiende middenklasse. De Association of Southeast Asian Nations ([ASEAN](#)) tracht op termijn een eengemaakte markt op te bouwen van 600 miljoen inwoners. Het BBP per capita ligt zo’n 50% boven dat van België. De O&O uitgaven bedragen 1.9% van het BBP, waarvan meer dan de helft publieke middelen zijn. Men focust op sectoren met hoge toegevoegde waarde (bijv. manufacturing maakt 21% uit van het BBP en om dat zo te houden plant men om deze sector de komende 10 jaar met zo’n 50% te laten groeien). De ondersteuning van onderzoek, innovatie en ondernemerschap is in hoge mate ontwikkeld met een sterk uitgebouwd geheel van agentschappen, beleidsinstrumenten en financiering dat inwerkt op elk onderdeel van de innovatieketen, steeds met excellentie als leidraad en ingebed in een sterke cultuur van samenwerking.

De welvaartsopbouw van Singapore in enkele decennia was mogelijk door een gecentraliseerd leiderschap met veel beslissingsmacht, een holistische langetermijnplanning, en tegelijk een spaarzaam sociaal contract met de bevolking. Het beleid tracht voor de Singaporezen immers een evenwicht te bewaren tussen herverdelingsmechanismen enerzijds en zelfredzaamheid anderzijds. Er is bijvoorbeeld een kwalitatieve en toegankelijke basisgezondheidszorg (*Medishield Life* voor Singaporezen en permanent residents) en daarnaast middelen voor meer premium medische uitgaven die werknemers opbouwen in een daartoe speciaal voorbehouden ‘rekening’ (o.a. *Medisave account*⁶), evenwel met enkele sociale correcties. Verder vereisen de ontwikkelingen van een competitieve economie steeds hoger geschoolde en bijgeschoolde werknemers. Daartoe hebben de Singaporezen toegang tot *credits* voor levenslang leren (*SkillsFuture* - <https://www.skillsfuture.gov.sg/>) met specifieke programma’s voor studenten, pas afgestudeerden en ‘mid-careerists’ die inzetten op upskilling (vaardigheden verbeteren), reskilling (nieuwe vaardigheden aanleren i.f.v. jobtransformatie), deepskilling (kennis verdiepen) of funskilling (vrijblijvend leren voor het plezier).

Ondanks de etnisch-culturele mix van de bevolking en de sterk gedifferentieerde behandeling van Singaporezen, *permanent residents* en tijdelijke arbeidskrachten zijn er weinig zichtbare sociale wrijvingen en wordt het land beschouwd als het meest vreedzame van Azië. De bevolking leeft gedisciplineerd en er is weinig politiek op straat te zien. De vrijheid van meningsuiting en van vereniging zijn in Singapore wel sterk beperkt. Er is ook politieke controle op culturele instellingen, en er is politiek alsnog slechts een kleine oppositie vertegenwoordigd. Heel wat zware arbeidsjobs worden ingevuld door goedkope buitenlandse werkkrachten aan beperkte arbeidsvoorwaarden (met een werkvergunning voor maximaal 5 jaar). Het beleid is sterk gericht op

¹ PISA Scores 2018 ([PDF](#)). OECD Programme for International Student Assessment (PISA)

² Corruption perceptions index 2022 ([PDF](#)). Transparency International. <https://www.transparency.org/en/cpi/2022>

³ Doing Business 2020 : Comparing Business Regulation in 190 Economies” ([PDF](#)). Openknowledge.worldbank.org.

⁴ Foreign direct investment, net inflows. The World Bank.

https://data.worldbank.org/indicator/BX.KLT.DINV.CD.WD?most_recent_value_desc=true

⁵ The Human Capital Index 2020 Update ([PDF](#))

⁶ Ministry of Health ([Medisave](#))

het invullen van de nationale prioriteiten (waaronder de economische groei en het verhogen van de zelfredzaamheid) en heeft eerder weinig aandacht voor globale uitdagingen. Singapore kampt voortdurend met allerlei schaarstes die de houdbaarheid van de gewenste groei onder druk zetten, maar is zich bewust van de uitdagingen en onderneemt doorlopend stappen om die problemen te verhelpen.

Omwille van de enorme economische expansie binnen de beperkte landoppervlakte werken de ruimtelijke uitvoeringsplannen met wel overwogen invullingen. In de huidige haven is er bijvoorbeeld slechts een concessie voor 20 jaar, daarna is de volgende bestemming van die ruimte reeds bekend (commerciële en residentiële invulling). Voor de havenactiviteiten worden infrastructuurplannen gemaakt op lange termijn met nu al 4 generaties haventechnologie die steeds meer gebruik maken van digitalisering en automatisering. Daardoor bleef het personeelsbestand van bijvoorbeeld havenuitbater PSA, een wereldspeler die ook in Antwerpen actief is, met ca. tienduizend werknemers in Singapore vrijwel stabiel doorheen de laatste 30 jaar maar met een duidelijke verschuiving naar meer 'highly skilled' technologie specialisten en minder arbeiders, terwijl het aantal behandelde containers met een factor 10 is toegenomen. Deze constante groei en technologische innovatie maken uitbreiding noodzakelijk, en die wordt ook al waargemaakt: De nieuwe TUAS haven (die mee werd gebouwd door Belgische/Vlaamse baggeraars) is voorzien op een verdubbeling van het aantal containerbehandelingen en zal nog meer geautomatiseerd zijn.

“De efficiënte en effectieve overheid die proactief was t.a.v. groeistrategieën, de hoogopgeleide Engelstalige bevolking... hebben van Singapore een belangrijke aantrekkingspool voor multinationale ondernemingen gemaakt”

De coördinatie van het economisch beleid bevindt zich op het hoogste overheidsniveau en is gericht op strategische nationale prioriteiten. De Singaporese strategie bestaat uit twee pijlers. Enerzijds het stimuleren van circulaire industriële eco-systemen en anderzijds het creëren van een innovatie-economie.

Binnen de overheid is de focus op excellentie permanent aanwezig en heerst er een cultuur van dialoog en samenwerking over zowel de strategie als over de uitvoering. De overheid organiseert om de vier, vijf jaar grote burgerconsultaties over waar het land naartoe moet, zoals er momenteel een loopt onder de naam Forward Singapore (<https://www.forwardsingapore.gov.sg/>) ter voorbereiding van de verkiezingen. Daarbij komen thema's aan bod zoals 'Economy and Job's', 'Education and Lifelong Learning', 'Health and Social Support', 'Home and Living Environment', 'Environmental and Fiscal Sustainability' en 'Singapore Identity'.

Men hanteert voor een topcarrière bij de overheidsadministratie of in de politiek een meritocratisch systeem, waarbij uitmuntendheid en sterke ervaring in meerdere beleidsdomeinen onontbeerlijk zijn. Topambtenaren en politici (ministers) worden o.a. geselecteerd en klaargestoomd voor een loopbaan in de overheidsadministratie en de politiek. De verloning bij de overheid is zeer competitief. Projecten en plannen worden strikt opgevolgd en uitgevoerd qua tijdslijn, budget en scope.

Concreet wordt de Singaporese economische strategie de jongste jaren opgesteld door de Committee for the Future Economy. Het rapport van deze Raad in 2017 was o.a. de aanzet voor de Industry Transformation Maps. Die grootschalige plannen grijpen in op 23 industriële sectoren in 6 clusters: Manufacturing, Built Environment, Trade & Connectivity, Essential Domestic Services, Modern Services en Lifestyle. De implementatie van de strategie is de verantwoordelijkheid van de Future Economy Council, deel van het ministerie van Handel en Industrie.

Singapore streeft er naar om een zo aantrekkelijk mogelijke omgeving te zijn voor ondernemingen, en buitenlandse investeringen in het bijzonder. Daarvoor heeft het een aantal meer algemene sterktes: Het juridisch kader en de rechtspraak functioneren zeer goed en snel. Vergunningen kunnen vlot worden bekomen. Er zijn bilaterale handelsakkoorden opgezet met andere landen in de regio om handel mogelijk te maken aan gunstige condities. Singapore is een logistieke hub voor Zuidoost Azië, met een grote luchthaven en 's werelds grootste containeroverslaghaven. Daardoor is het een interessante toegangspoort tot 'China+', waarbij diversificatie mogelijk is naast China, via o.a. India, Vietnam, Maleisië. De voertaal is Engels, hetgeen in een

handelscontext bijdraagt aan de internationale positionering. Er is tot slot lokaal talent aanwezig, dankzij het ambitieus maar zeer veeleisend onderwijssysteem (o.a. inzetten op 21ste-eeuwse vaardigheden, STEM-vakleerkrachten voor leerlingen vanaf 9 jaar, een prestigieuze lerarenopleiding met strenge selectie en goede verloning en topuniversiteiten met toelatingsexamens).

Het eiland heeft ook geen netto staatsschuld. Dat komt onder meer doordat Singapore zijn begrotingsoverschotten jarenlang in de hele wereld heeft belegd (via de 'sovereign wealth funds' Temasek en GIC), zodat het elk jaar dividenden opstrijkt, die worden geschat op 5% van het BBP.

Daarnaast zijn er 3 instanties onder het ministerie van Handel en Industrie die de innovatie-, investerings- en ondernemersactiviteiten actief in handen nemen: (1) De Economic Development Board (EDB) is verantwoordelijk voor het aantrekken van buitenlandse investeringen en het ondersteunen van lokale bedrijven met de nadruk op sectoren met hoge toegevoegde waarde zoals maakindustrie, elektronica, farma en chemie. Na erkenning door de EDB kunnen bedrijven toegang krijgen tot aantrekkelijke fiscale voorwaarden en een goed functionerend systeem van overheidssteun. Zo is er een 'Pioneer tax incentive' voor bedrijven die kunnen aantonen dat hun expertise aanzienlijk geavanceerder is dan wat reeds beschikbaar is, en een 'headquarter award' met verminderde vennootschapsbelasting voor bedrijven die een regionaal of internationaal hoofdkantoor in Singapore vestigen. Voor een deel experimenteren ze ook met investeringen in opkomende technologieën, bijvoorbeeld in de aquacultuur (geïnspireerd op het succes van de zalm in Europa) en kwantumtechnologie.

JTC Corporation (2) voorziet hoogstaande industrieparken om aantrekkelijke bestemmingen en circulaire industriële ecosystemen te creëren voor Singapore's talent en sectorgemeenschappen. (De technologieparken functioneren bovendien als 'testbeds' voor prototypes).

Enterprise Singapore (ESG) met inbegrip van het zelfstandig agentschap IPI Singapore dat zich richt op kmo's (3) zorgt voor het stimuleren van het lokale innovatie-ecosysteem dat de groei van lokale bedrijven ondersteunt. Zo hebben ze een top-down aanpak om grote bedrijven als "challenge owners" te koppelen aan lokale "challenge solvers" om oplossingen te bieden en nieuwe business te creëren. Het is opvallend hoe intensief deze agentschappen hun activiteiten onderling afstemmen. De leidende ambtenaren van de belangrijkste agentschappen zitten bijvoorbeeld in elkaars raad van bestuur om de communicatielijnen kort te houden. Hun strategieën en initiatieven om de oprichting van complete ecosystemen te vergemakkelijken, hebben Singapore geholpen een van 's werelds toonaangevende zakencentra te worden.

Specifiek voor innovatie worden 5-jaarlijks globale plannen gemaakt. Het jongste daarvan is het Research, Innovation and Enterprise 2025 Plan (RIE2025) dat opgesteld is rond 4 prioriteiten: Manufacturing, Trade & Connectivity; Human Health & Potential; Urban Solutions and Sustainability; Smart Nation and Digital Economy en 3 horizontale programma's: Academic Research, Manpower, Innovation & Enterprise. Zo'n 5-jarig RIE plan wordt gedurende 2 jaar voorbereid met uitgebreide consultaties in de triple helix (overheid, bedrijven, kennisinstellingen, dus niet quadruple helix waarbij de maatschappij/burger de vierde overlegpartner is) om overbodige dubbele inspanningen te vermijden (defragmentatie), de meest verdienstelijke ideeën en projecten te ondersteunen (excellentie) en nog grotere impact te realiseren (rekening houdend met de absorptiecapaciteit van de lokale economie, inclusief de MNCs die in Singapore innoveren) op basis van de gestaag groeiende en aanhoudende investeringen door de overheid. De coördinatie en financiering gebeuren door de National Research Foundation (NRF) onder leiding van de eerste minister maar de operationele beslissingen worden op een zo laag mogelijk niveau genomen en er wordt enkel ingegrepen indien nodig. Driekwart van het totale budget gaat naar het ondersteunen van wetenschappelijk onderzoek, onderzoekscapaciteiten bij universiteiten en onderzoeksinstellingen en innovatie en ondernemersactiviteiten. Hoewel het land zich traditioneel heeft gericht op een top-down benadering, streeft het nu naar een derde van de steun (in Vlaanderen is dat ca. twee derde) voor bottom-up initiatieven en wordt het belang van fundamenteel onderzoek erkend voor het verrijken van de wetenschapsbasis. (Tegelijkertijd werd benadrukt dat Vlaanderen erg trots mag zijn op zijn bottom-up onderzoeks- en innovatiecultuur alsook op de omvang van de O&O uitgaven die >3% van het BBP bedragen.) Daarnaast wordt ook zo'n 9% van het budget gewijd aan het ontwikkelen van talent en vaardigheden via



levenslang leren. Tot slot wordt 15% gereserveerd voor prioriteiten die pas tijdens de uitvoering van het plan worden bepaald ('white space') in functie van de noden op dat moment om wendbaarheid van de middelen in te bouwen.

De topuniversiteiten hebben sterk kunnen profiteren van de RIE plannen en hun voorgangers sinds 1995. De Nanyang Technological University Singapore wordt door verschillende internationale maatstaven beschouwd als een van de meest prestigieuze universiteiten ter wereld. NTU staat volgens de 2023 QS World University Rankings op de 19e plaats in de wereld en staat sinds 2015 ook wereldwijd op de 1e plaats onder jonge universiteiten. Ze hebben een snelle omschakeling gemaakt van een onderwijs- naar een onderzoeksintensieve universiteit, gedisciplineerd door strenge KPI's. Zo worden contracten van ondermaats presterend tenure-track personeel niet verlengd. Hun onderwijsaanpak is gebaseerd op teamgebaseerd leren in samenwerkingsruimten, een aanpak die samen met het Imperial College London is ontwikkeld. Ze slagen er in om een kruisbestuiving tussen STEM-studies (Wetenschap, Technologie, Techniek en Wiskunde) en SHAPE-studies (Sociale Wetenschappen, Humane wetenschappen, Kunst voor Mensen en Economie) in te bouwen in het curriculum. NTU is een onderzoeksintensieve openbare universiteit met 33.000 bachelor- en masterstudenten en de thuisbasis van verscheidene autonome instituten van wereldfaam. Zo is bijvoorbeeld het Singapore Centre for Environmental Life Sciences Engineering (SCELSE) er gehuisvest.

SCELSE is een van de vijf Research Centres of Excellence (RCE's) van Singapore, onderzoeksinstituten die binnen NUS of NTU zijn opgericht om "onderzoeksexcellentie in de lokale universiteiten te stimuleren". Het grootste deel van hun basisfinanciering komt van het NRF, maar ook de universiteiten en externe financiers dragen bij. Zij zijn gehuisvest in de universiteiten, maar krijgen een zekere mate van autonomie wat hun onderzoeksagenda betreft. Het RCE-programma is een belangrijke pijler in het algemene O&O-ecosysteem, aangezien zij de bestaande kennisbasis in de universiteiten benutten en exploiteren om zich op nieuwe onderzoeksgebieden te wagen. Het uiteindelijke doel is om onderzoeksresultaten te produceren die "aansluiten bij de strategische langetermijnbelangen van Singapore". SCELSE is een samenwerkingsverband tussen beide topuniversiteiten NTU en NUS. In SCELSE wordt multidisciplinair onderzoek gedaan naar biofilms met toepassingen in antibiotica, microbiom en eencellige eiwitten. Hun kernfinanciering is voor 'blue sky research'. Het centrum heeft een aanzienlijke kritische massa (ongeveer 200 mensen) en beschikt over state-of-the-art apparatuur.

De National University of Singapore (NUS) is de oudste en meest gevestigde openbare onderzoeksuniversiteit van Singapore. NUS scoort consequent hoog onder academische instellingen in de wereld - vanaf 2022-2023 staat NUS wereldwijd op de 11e plaats volgens de QS World University Rankings. Hun multidisciplinaire benadering van onderwijs, onderzoek en ondernemerschap stelt hen in staat om nauw samen te werken met het bedrijfsleven, overheden en de academische wereld om cruciale en complexe kwesties aan te pakken die relevant zijn voor Azië en de wereld (energie, milieu en stedelijke duurzaamheid; behandeling en preventie van ziekten die veel voorkomen bij Aziaten; actief ouder worden; geavanceerde materialen; evenals risicobeheer en veerkracht van financiële systemen). De universiteit telt 17 faculteiten verspreid over drie campussen en bijna 40.000 studenten uit 100 landen. NUS Enterprise speelt een centrale rol bij het bevorderen van innovatie en ondernemerschap aan de NUS en daarbuiten. Het bevordert actief ondernemerschap en cultiveert mondiale denkwijzen en talenten door de synergie van ervaringsgericht ondernemerschapsonderwijs en actieve partnerschappen met het bedrijfsleven. NUS is ook gastheer van de CREATE campus voor internationale samenwerking met o.a. Berkeley, Cambridge, ETH Zurich, MIT, Technische Universität München, CNRS.

Alle universiteiten zetten actief in op het aantrekken van buitenlands onderzoekstalent. Minder dan 40% van de tenure track academici zou de Singaporese nationaliteit hebben. Het overkoepelende onderzoeksagentschap A*STAR en de universiteiten doen o.a. aan 'joint hiring', voorzien top-up salaries. Men pakt ook uit met de hoge ranking en het prestige van de topuniversiteiten en met de hoge slaagkans voor projectaanvragen. Die internationale onderzoekers worden daarna vaak actieve ambassadeurs voor Singapore.



A*STAR - Agency for Science, Technology and Research, kan worden gezien als de Singaporese "Super-SOC" met 5500 onderzoekers. De activiteiten van A*STAR strekken zich uit van fundamenteel wetenschappelijk onderzoek tot toegepast onderzoek. Sterktes bevinden zich o.a. in de biomedische technologie, biochemie, moleculaire biologie en genetica, scheikunde en natuurkunde. A*StartCentral is een eigen incubator en accelerator voor het ondersteunen van groeiende deeptech-startups en het versterken van de startup-gemeenschap in het algemeen. Verschillende onderzoeksinstituten en innovatieclusters zitten onder de vlag van A*STAR. Zo is er bijvoorbeeld SIMTech (Singapore Institute for Manufacturing Technology) dat kan worden beschouwd als de Singaporese tegenhanger van "Flanders Make". Om kmo's te bereiken werd door hen een "modelfabriek" gecreëerd waarin Industry 4.0-innovaties worden getoond. NAMIC Singapore (National Additive Manufacturing Innovation Cluster) is dé organisatie om de mogelijkheden van 3D additive manufacturing te promoten en spelers uit de industrie, onderzoekers en de overheid met elkaar in contact te brengen om veelbelovende additive manufacturing technologieën te identificeren. Beide dragen bij aan de doelstelling van Singapore om tegen 2030 het aandeel van de verwerkende industrie in het BBP van 20% naar 30% te brengen.

Daarnaast worden ook innovatiecentra ('Technology Centres' en 'Centres for innovation') opgezet in samenwerking met polytechnische scholen en andere onderzoeksinstituten. Die innovatiecentra zijn ontworpen als industriespecifieke one-stop shops die een scala aan kant-en-klare voorzieningen aanbieden aan kmo's die op zoek zijn naar technologische innovatie. Het Environmental & Water Technology Centre Of Innovation, EWTCOI werd opgericht als een strategische samenwerking tussen Enterprise Singapore en Ngee Ann Polytechnic. Bedrijven kunnen er gebruik maken van de expertise en middelen van het centrum in vier aandachtsgebieden: water, duurzame materialen, energie-efficiëntie en membraantechnologie. Er is bedrijfslaboratoriumruimte beschikbaar op huur- of projectbasis op de campus, waar stagiairs en studenten kunnen meewerken aan industriële projecten. Het centrum beschikt ook over een pilootlijn voor membraantechnologie en uitgebreide karakteriseringsapparatuur.

Er is tot slot ook een rijk aanbod aan incubatoren en startup hubs met financiering van verschillende grootteordes van kleine start-ups tot zogenaamde unicorns. Zo is SGInnovate een innovatieplatform van de overheid dat ondernemerschap ondersteunt gericht op de ontwikkeling van deeptech. Het helpt ondernemers bij het lanceren, bewijzen en opschalen van deeptech-producten die voortkomen uit wetenschappelijk onderzoek. Ze richten zich op opkomende sectoren met zeer competitieve funding (slechts ca. 10 op 1000 voorstellen worden gesteund, dat is gelijkaardig aan wat een 'commerciële' VC zou hanteren) Series A/B financiering. SGInnovate beheert ook een deel van een publieke en private co-investeringsregeling die aandeleninvesteringen verstrekt aan startende technologiebedrijven. Start-ups worden op een holistische manier omringd met 'cash, talent en community' (Startup SG - <https://www.startupsg.gov.sg/>).

VARIO wenst Flanders Investment & Trade, in het bijzonder Kim Demeyer en Siow Boon Chia, uitdrukkelijk te bedanken voor de goede samenwerking bij de organisatie van deze missie.



SAMENVATTING VAN DE 'LESSONS LEARNED'

Beleid:

- Het beleid is van zeer hoge kwaliteit. Binnen de overheid is de focus op excellentie permanent aanwezig en heerst er een cultuur van samenwerking. Topambtenaren en politici (ministers) worden geselecteerd en klaargestoomd voor een loopbaan in de overheidsadministratie en de politiek. Sterke uitgebreide ervaring (in internationale academische wereld en internationaal bedrijfsleven) zijn er onontbeerlijk voor een topcarrière bij de overheidsadministratie of in de politiek. Men hanteert een meritocratisch systeem met een strenge opvolging van de doelmatigheid van de gespendeerde beleidsmiddelen.
- Het innovatiebeleid steunt op grootschalige, holistische en vooral grondig voorbereide 5-jaren RIE-plannen. De thematische invulling hangt grotendeels af van de absorptiecapaciteit van de lokale economie, inclusief de MNCs die in Singapore innoveren.
- De overheid organiseert om de vier, vijf jaar grote burgerconsultaties over waar het land naartoe moet, zoals er momenteel een loopt onder de naam Forward Singapore (<https://www.forwardsingapore.gov.sg/>) ter voorbereiding van de verkiezingen. Daarbij komen thema's aan bod zoals 'Economy and Jobs', 'Education and Lifelong Learning', 'Health and Social Support', 'Home and Living Environment', 'Environmental and Fiscal Sustainability' en 'Singapore Identity'. Specifiek voor de RIE-plannen gebeurt de voorbereiding via triple helix overleg (overheid, bedrijven, kennisinstellingen), en niet via quadruple helix.
- De 'whole of government' aanpak voor onderzoek, innovatie, ondernemerschap en economie (geen minister van innovatie, wel onder de eerste minister met directe betrokkenheid van ministers van industrie en handel, onderwijs, gezondheidszorg en defensie) zorgt voor gecentraliseerd leiderschap en een sterke buy-in van alle ministers en overheidsinstellingen.
- De agentschappen met een rol in innovatie stemmen hun activiteiten onderling intensief af. De leidende ambtenaren van de belangrijkste agentschappen zitten bijvoorbeeld in elkaars raad van bestuur om de communicatielijnen kort te houden.

Talent

- Excellentie-gericht en ambitieus onderwijssysteem (o.a. een prestigieuze lerarenopleiding met strenge selectie en topuniversiteiten).
- Sterke cultuur van LLL: de Singaporezen hebben toegang tot *credits* voor levenslang leren (*SkillsFuture* - <https://www.skillsfuture.gov.sg/>) met specifieke programma's voor studenten, pas afgestudeerden en 'mid-careerists'.
- Aantrekken van internationaal toptalent: In 2022 werden zo'n 187000 'Employment Passes' afgeleverd voor hogeschoolden⁷. Singapore is het op een na meest talent-competitieve land ter wereld⁸ en staat ook tweede voor het aantrekken van talent. Er blijft wel een uitdaging om dat talent ook te behouden (36^e plaats).
- Ook alle universiteiten zetten actief in op het aantrekken van buitenlands onderzoekstalent. Het overkoepelende onderzoeksagentschap A*STAR en de universiteiten doen o.a. aan 'joint hiring', voorzien top-up salaries. Men pakt ook uit met de hoge ranking en het prestige van de topuniversiteiten en met de hoge slaagkans voor projectaanvragen.

Multidisciplinariteit in onderwijs en onderzoek

- Universitair onderwijs is gebaseerd op teamgebaseerd leren in samenwerkingsruimten, een aanpak die samen met het Imperial College London is ontwikkeld. Ze slagen er in om een kruisbestuiving tussen

⁷ Foreign workforce numbers. (<https://www.mom.gov.sg/documents-and-publications/foreign-workforce-numbers>)

⁸ Global Talent Competitiveness Index 2022. (<https://www.insead.edu/sites/default/files/assets/dept/fr/gtci/GTCI-2022-report.pdf>)

STEM-studies (Wetenschap, Technologie, Techniek en Wiskunde) en SHAPE-studies (Sociale Wetenschappen, Humane wetenschappen, Kunst voor Mensen en Economie) in te bouwen in het curriculum.

- Hun multidisciplinaire benadering van onderwijs, onderzoek en ondernemerschap stelt hen in staat om nauw samen te werken met het bedrijfsleven, overheden en de academische wereld om cruciale en complexe kwesties aan te pakken die relevant zijn voor Azië en de wereld.

Ecosystemen

- Aantrekken buitenlandse kennisintensieve investeringen: aantrekkelijke en stabiele condities voor ondernemingen in het algemeen, maar ook actief aantrekken van multinationals door bijkomende incentives vanuit de verantwoordelijke agentschappen.
- Ontwikkelen en doorgroeien van lokale bedrijven: Innovatiecentra zijn ontworpen als industriespecifieke one-stop shops die een scala aan kant-en-klare voorzieningen aanbieden aan kmo's die op zoek zijn naar technologische innovatie. Ze zijn gezamenlijke initiatieven van kennisinstellingen enerzijds en overheidsagentschappen anderzijds. Verder experimenteert Singapore ook met investeringen in 'testbeds' voor opkomende technologieën, bijvoorbeeld in kwantumtechnologie en in aquacultuur, geïnspireerd op het succes van de zalmkwekerijen in Europa.
- Versterken van de verwevenheid tussen buitenlandse multinationals en lokale bedrijven: succesvolle top-down aanpak om grote bedrijven als "challenge owners" te koppelen aan lokale "challenge solvers" om oplossingen te bieden en nieuwe business te creëren.

ANNEX: FOLDER STUDIEREIS

VARIO

Vlaamse Adviesraad voor
Innoveren & Ondernemen



Vlaanderen
is ambitieus

VARIO STUDIEREIS SINGAPORE 4-11 MAART 2023



PROGRAM	Sunday, March 5, 2023	Monday, March 6, 2023	Tuesday, March 7, 2023	Wednesday, March 8, 2023	Thursday, March 9, 2023	Friday, March 10, 2023
9:00		Introductory Briefing by Flanders Investment & Trade			Meeting - SGIInnovate	
9:30			Meeting - JTC Corporation Visit - one-north			
10:00				Meeting - Economic Development Board		
10:30						
11:00		Meeting - National Research Foundation + Ministry of Trade and Industry			Visit - Environmental & Water Technology Centre of Innovation (EWTCOI)	
11:30				Meeting - Enterprise Singapore + IPI Singapore		
12:00		Lunch - Sapore Italian Restaurant	Lunch - Arkadas			
12:30					(TBC) Lunch - Sawadee Thai Cuisine	Lunch - Beng Hiang
13:00						
13:30		Meeting - National University of Singapore (NUS)				
14:00				Meeting - Venturi Partners		Meeting - Nanyang Technological University (NTU)
14:30					Visit - SingHealth Polyclinics - Eunos	
15:00		Meeting - Enlipsisium				
15:30		Visit - Tour of Incubation Facility at BLOCK71	Visit - Singapore Institute of Manufacturing Technology (SIMTech)		Visit - Singapore Centre for Environmental Life Sciences Engineering	Meeting - DEME + Jan De Nul
16:00						
16:30			Meeting - National Additive Manufacturing Innovation Cluster (NAMIC) Coordinating Office			
17:00			Meeting - Agency for Science, Technology and Research (A*STAR)			
17:30			Visit - A*START Central Tour			
18:00						

Day 1: Monday, March 6

Introductory Briefing by Flanders Investment & Trade

AGENDA
Overview on Singapore and its innovation landscape. Presentation of visit programme.
FIT
Flanders Investment and Trade (FIT) is the trade and investment promotion agency of the Flemish region of Belgium. FIT’s mandate includes: helping companies based in Flanders to export and internationalise; encouraging foreign companies to invest and expand in Flanders; developing Flanders’ internationalisation strategy together with partners; and, boosting the international marketing of Flanders-based innovation and putting Flanders on the map worldwide. The office in Singapore is among the ten Science & Technology Offices established in innovation hotspots worldwide to promote economic diplomacy and put Flanders on the technology map.
Contacts
Mr Kim DEMEYER, Science and Technology Counsellor, Flanders Investment and Trade Ms CHIA Siow Boon

Meeting - National Research Foundation + Ministry of Trade and Industry

AGENDA
NRF: The role of the National Research Foundation (NRF) and understanding the five-year Research, Innovation and Enterprise (RIE) plans. MTI: The Future Economy Council (FEC) and its strategies for driving enterprise and industrial innovation; particularly its role in launching and overseeing the Industry Transformation Maps (ITMs) as well as the ways by which synergies between ITM 2025 and the Research, Innovation and Enterprise (RIE) 2025 plans can be/are achieved.
NRF
The National Research Foundation, Singapore (NRF), set up on 1 January 2006, is a department within the Prime Minister’s Office. The NRF sets the national direction for research and development (R&D) by developing policies, plans and strategies for research, innovation and enterprise. It also funds strategic initiatives and builds up R&D capabilities by nurturing research talent. Key among the strategies for research, innovation and enterprise is the five-year Research, Innovation and Enterprise (RIE) plans (formerly known as the National Technology Plan). The latest, RIE 2025, was announced in 2020 with the Singapore Government pledging about 1% of GDP, or S\$25B, for investments in RIE activities from 2021 – 2025.
Key persons
- Mr BEH Kian Teik, Chief Executive Officer - Dr Poh Wei Theng, Deputy Director, International Relations

NATIONAL RESEARCH FOUNDATION
PRIME MINISTER'S OFFICE
SINGAPORE



BEH Kian Teik

Chief Executive Officer
National Research Foundation

Mr Beh Kian Teik is the Chief Executive Officer of the National Research Foundation (NRF) from 6 August 2022. He joined NRF as the Deputy Chief Executive Officer since 1 July 2020, and is responsible for reviewing, developing and implementing the national RIE strategies and governance frameworks, to grow and sustain a vibrant RIE ecosystem in Singapore.

Prior to joining NRF, Mr Beh held roles of increasing responsibilities in Economic Development Board for over 22 years. His last role was Executive Vice President of EDB and oversaw EDB New Ventures. He worked with corporate entrepreneurs with the passion and drive to create early-stage ventures in Singapore. He has over twenty years' experience of promoting foreign direct investment and building industries in the manufacturing and internationally tradeable services sectors.

Previously, he was responsible for EDB's activities in innovation & industry incubation and led efforts to foster industry-science linkages. In 2010, he was also the founding director of the Singapore Biomedical Sciences Industry Partnership Office, a unique inter-agency government organisation. In this role, he worked with senior Singapore scientists to partner industry to translate science to medicine, and with industry partners that undertook R&D projects requiring the capabilities of multiple Singapore agencies in basic sciences and clinical research.

Mr Beh is a Sundstrand-EDB and Glaxo-EDB scholar who graduated from the University of California, Berkeley with an MSc in Electrical Engineering, as well as a BSc in Electrical & Computer Engineering from the University of Illinois at Urbana-Champaign.

MTI
<p>The Ministry of Trade and Industry is a ministry of the Government of Singapore responsible for the formulation and implementation of policies related to the development of business, trade and industry in Singapore. It takes the lead to promote economic growth and create good jobs to enable Singaporeans to improve their lives.</p> <p>MTI oversees nine statutory boards/agencies (namely Agency for Science, Technology and Research (A*STAR), Competition & Consumer Commission of Singapore (CCCS), Economic Development Board (EDB), Energy Market Authority (EMA), Enterprise Singapore (Enterprise SG), Hotels Licensing Board (HLB), JTC Corporation (JTC), Sentosa Development Corporation (SDC) and Singapore Tourism Board (STB)), and one government department (Department of Statistics (DOS)).</p> <p>The Future Economy Planning Office in MTI supports the Future Economy Council (FEC), which is set up to support the growth and transformation of Singapore’s economy for the future and to implement strategies developed by the Committee on the Future Economy (CFE) - a committee convened by Prime Minister Lee Hsien Loong in 2016 to review Singapore’s economic strategies.</p>
Key persons
TBD

Meeting - National University of Singapore (NUS)

AGENDA
<p>Focus on the National University of Singapore’s efforts in innovation, entrepreneurship and research translation. Meeting with a startup from the NUS Graduate Research Innovation Programme (GRIP).</p>
NUS
<p>The National University of Singapore (NUS) is Singapore’s oldest and most established public research university. NUS consistently ranks highly among academic institutions in the world - as of 2022–2023, NUS is 11th worldwide according to QS World University Rankings and 19th worldwide according to the Times Higher Education World University Rankings.</p> <p>The University’s multidisciplinary and real-world approach to education, research and entrepreneurship enables us to work closely with industry, governments and academia to address crucial and complex issues relevant to Asia and the world. It has 17 faculties across three campuses in Singapore – Kent Ridge, Bukit Timah and Outram – and close to 40,000 students from 100 countries.</p> <p>Researchers in its faculties, 29 university-level research institutes, research centres of excellence and corporate labs focus on themes that include energy, environmental and urban sustainability; treatment and prevention of diseases common among Asians; active ageing; advanced materials; as well as risk management and resilience of financial systems.</p> <p>NUS Enterprise, the entrepreneurial arm of the National University of Singapore (NUS), plays a pivotal role in advancing innovation and entrepreneurship at NUS and beyond. It actively promotes entrepreneurship and cultivates global mind-sets and talents through the synergies of experiential entrepreneurial education, active industry partnerships, holistic entrepreneurship support and catalytic entrepreneurship outreach.</p>
Key Persons
<ul style="list-style-type: none"> - Assoc Prof Benjamin TEE, is Associate Vice President (NUS Enterprise) and Vice Dean (Research), College of Design and Engineering - Prof YUE Chee Yoon, Director, NUS Enterprise - Mr Brian KOH, Director, Ecosystem Development, Digital Infrastructure & Corporate Partnerships & Programs, NUS Enterprise



Associate Professor Benjamin Tee

Associate Vice President (Enterprise)

benjamin.tee@nus.edu.sg

Associate Professor Benjamin Tee is Associate Vice President (NUS Enterprise) at the National University of Singapore. He is also Vice Dean (Research) at the NUS College of Design and Engineering, and Principal Investigator at Sensors.AI Systems Labs, where he leads the research and development of novel technologies poised to revolutionise healthcare, robotics and Artificial Intelligence.

Benjamin's research and translation of technologies at the cutting edge of materials science, mechanics, electronics and biology has been recognised through numerous accolades. These include the James Dyson International Award (2021) for his team's work on healthcare sensors, MIT TR35 Innovator (Global) award (2015), and World Economic Forum's Young Scientist of 2019. He was also awarded the prestigious Singapore National Research Foundation Fellowship (2017) and NUS Presidential Young Professorship (2017).

Benjamin's experience in scientific innovation is complemented by an entrepreneurial spirit, having co-founded two successful medical technology companies, Privi Medical and Hannah Life Technologies, as well as filed over ten patents, several of which are exclusively licensed to industry.

Benjamin graduated with a Bachelor of Science in Electrical Engineering from the University of Michigan-Ann Arbor in 2006. At Stanford University, he received his Master of Science in Electrical Engineering in 2007 and his PhD in Electrical Engineering in 2014. He was also a Singapore-Stanford Biodesign Global Innovation Postdoctoral Fellow in 2014.



Professor Yue Chee Yoon

Director, NUS Enterprise

Prof YUE Chee Yoon is Director at NUS Enterprise. He is Academic Director for the Master of Science in Venture Creation programme and the NUS Overseas Colleges (NOC). Since joining NUS in October 2021, he has led the successful establishment of an Executive Programme in Innovation & Enterprise and PhD degree (Innovation Track). He obtained his Bachelor's and PhD degrees in materials science and engineering at Monash University, Australia.

He was previously a full professor in NTU, where he served in numerous leadership positions creating, developing, and directing research and educational programmes in collaboration with many universities all over the world. At NTU, he held various senior appointments including Associate Provost-Graduate Education, Founding Dean of the Interdisciplinary Graduate School, Founding Director of the Institute for Sports Research, Programme Chair of Singapore-MIT Alliance, Dean of School and Head of Division. He was Visiting Scientist at the Massachusetts Institute of Technology, USA from 2009-2010. Through his close collaboration in MIT, Prof Yue gained valuable insight on entrepreneurial culture in the USA and championed entrepreneurship education in NTU, instilling into students a good understanding and appreciation of entrepreneurial thinking.

He was awarded the Singapore Public Administration Medal (Silver) in 2002. He completed an Executive Programme at the School of Public Policy and Management in Tsinghua University, China. He is Member of Dean's Advisory Council, Monash University Faculty of Engineering Australia, and Deputy Chairman of the Ngee Ann Polytechnic Engineering Advisory Committee. He is Fellow of the Academy of Engineering Singapore and Fellow of the Institution of Engineers, Singapore. He is actively working on the commercialization of two inventions with colleagues.

Brian KOH

Director, Ecosystem Development, Digital Infrastructure & Corporate Partnerships & Programs.

Brian is a Director with NUS Enterprise, and oversees Ecosystem Development, Digital & Data Infrastructure, and Corporate Partnerships & Program. He has been involved in building up the eco-system supporting the startups and entrepreneurs both on and off-campus & regionally, establishing the infrastructure, programs and networks for the eco-system. This includes building up Block71, which has now become part of the JTC Launchpad area; an iconic entrepreneurial space in Singapore. He has been actively involved in building up “deep-tech” startups and of late having a keen interest in Foodtech, Agritech and Aquatech. Brian also oversees the Innovation for Societal Impact team with a purpose to see Innovation and Entrepreneurship enterprises with a heart. Prior to NUS, Brian together with some friends were involved in pioneering Adroit Innovations from a start-up company to be a publicly listed company on the main board of the Singapore Stock Exchange in 2000. In his last position in Adroit, Brian headed and led the Malaysia operations, sales & marketing, and general management activities. Built a profitable market presence for this regional subsidiary.

Meeting – Enlipsisium

AGENDA
Short presentation about Enlipsisium, sharing of experience of being in the NUS GRIP, and the company’s next steps in international expansion.
Enlipsisium
Enlipsisium is a National University of Singapore (NUS) Graduate Research Innovation Programme (GRIP) company i.e. a spin off company driven by NUS-developed technology. Founded in 2020 as an advanced material startup, Enlipsisium currently holds 3 patents in the area of perovskite and luminescent materials. It is one of the first companies in the world to have successfully taken X-ray images with nano-perovskite scintillators. Enlipsisium has a fully functional chemical wet lab and material scale up capabilities in Singapore.
Key persons
- Mr Tommy THAM, Founder and Director of Product Development

Visit - Tour of Incubation Facility at BLOCK71

SUMMARY
Tech startup ecosystem builder established by NUS Enterprise
BLOCK71
BLOCK71 is an initiative by NUS Enterprise in collaborative and strategic partnerships with established corporates and government agencies. It is a technology-focused ecosystem builder and global connector which catalyses and aggregates the start-up community. In Singapore, it spearheads new initiatives and provide mentorship and growth opportunities in key local, regional and global markets.

Day 2: Tuesday, March 7

Meeting - JTC Corporation & Visit - One-north

AGENDA

The ways by which JTC Corporation contributes to the growth of industries and enterprises and fosters innovation through the strategic development of industrial infrastructure. Sharing on one-north estate.

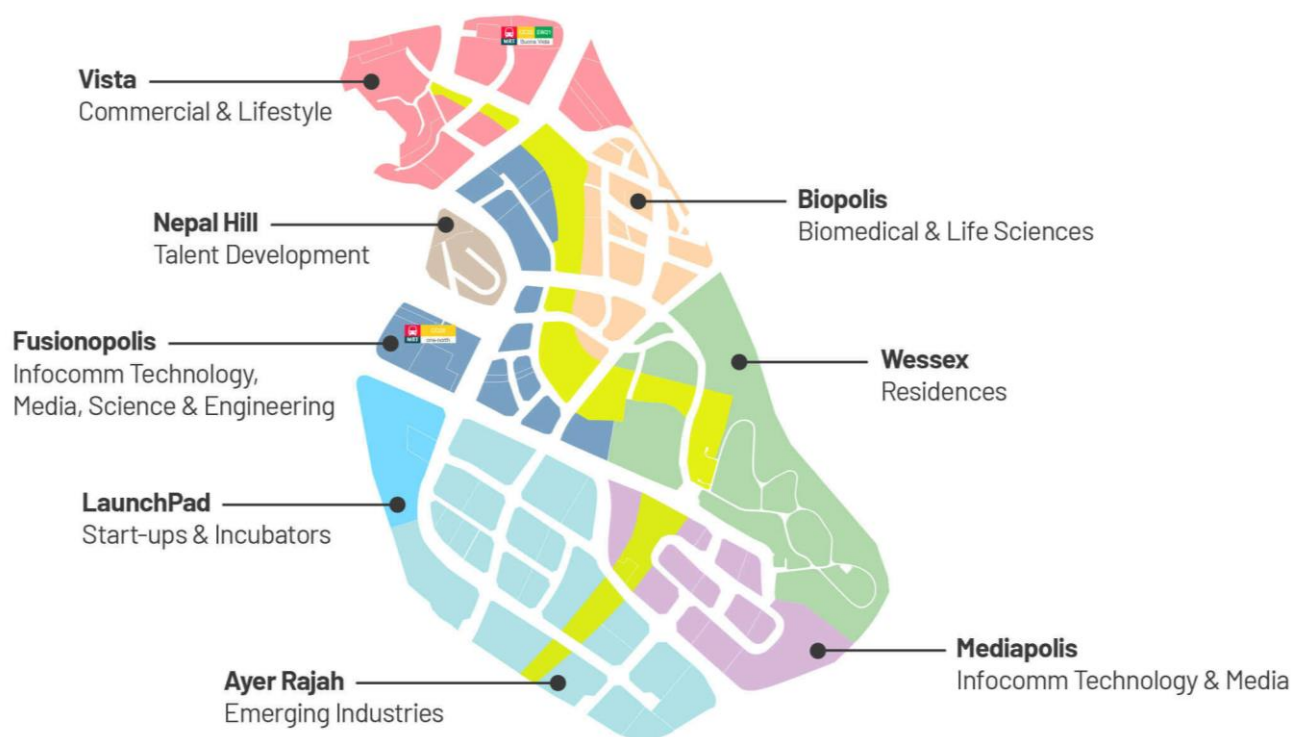
Includes photo taking, visit to the Sky Garden (should weather permit) and tour around the JTC One-North Multimedia Gallery.

JTC

JTC Corporation, formerly the Jurong Town Corporation, is a statutory board under the Ministry of Trade and Industry that champions sustainable industrial development. It master-plans clean, green and smart estates to create attractive destinations for Singapore’s talent and communities. It also drives innovation in the building and infrastructure sector.

Notable projects developed by JTC include the Jurong Industrial Estate, one-north, CleanTech Park, Seletar Aerospace Park, and the upcoming Punggol Digital District.

one-north is a 200-hectare (2 sq km) development in Buona Vista planned and developed by JTC Corporation. It was conceptualised in 1991 as part of the country’s National Technology Plan, and designed as a hub for R&D, and named to reflect Singapore’s position just one-degree north of the equator. It combines educational institutes, residences and recreational amenities with research facilities to create a “work-live-play-learn” environment. The development comprises Biopolis, Fusionopolis, Mediapolis, Wessex, one-north Park, Rochester Park, Pixel, Nepal Hill, Vista and JTC LaunchPad @ one-north. one-north aims to support the growth of Singapore’s biomedical sciences, infocommunications technology, media, physical sciences and engineering sectors.



Key persons

- Mr David TAN, Assistant Chief Executive Officer, Development Group



DAVID TAN
Alternate Director

Mr David Tan has been appointed on 1 Sep 2020 as Alternate Director to the new Chief Executive Officer of JTC Corporation.

Mr Tan is the Assistant Chief Executive Officer, Development Group of JTC Corporation, the lead government agency responsible for the provision of land, space and information to strengthen the competitiveness and catalyse the transformation

of industries and enterprises in Singapore.

Mr Tan has professional experience in engineering and innovation to industry development; having been involved in the planning, design, construction and project management of major infrastructure, building and reclamation projects. He was involved in the development of the Jurong Island as the world’s top ten chemical and energy hub, and Jurong Rock Caverns, South East Asia’s first underground liquid hydrocarbon storage and terminalling facility. He now oversees the master planning and development of JTC’s next generation industrial estates like one-north, Jurong Innovation District, Punggol Digital District and Woodlands North Coast.

Mr Tan is also a member of the Development Projects Advisory Panel, the Industry Advisory Committee of the Engineering Science Programme of the National University of Singapore, and the SinBerBEST Scientific Advisory Board.

Mr Tan has a BEng in Civil Engineering (1st Class Honours) from the University of Adelaide and MSc in Engineering from the National University of Singapore.

Meeting - Venturi Partners - Nicholas Cattor

Agenda
Investment opportunities, support and pitfalls with respect the consumer business in Singapore.
VENTURI PARTNERS
Venturi Partners is an investment platform for families looking to invest in Asia’s consumer growth story. It aims to be a force for long term sustainable growth and want brands under its portfolio to have a positive impact on the people who chose them and the environment in which we live.
Key persons
- Nicholas Cator, Founder and Managing Partner

Meeting - National Additive Manufacturing Innovation Cluster (NAMIC) Coordinating Office & Visit - Singapore Institute of Manufacturing Technology (SIMTech) & Meeting - Agency for Science, Technology and Research (A*STAR) & Visit - A*STAR Central Tour

AGENDA
<ol style="list-style-type: none"> 1. Visit to SIMTech, with facility tour of MedTech Manufacturing Division and Smart Microfluidics Lab. 2. Short meeting with National Additive Manufacturing Innovation Cluster (NAMIC) Coordinating Office for an overview of their work in connecting industry players, researchers and the government to identify promising additive manufacturing technologies. 3. A*STAR: The role of Agency for Science, Technology and Research (A*STAR) in driving and advancing research and innovation in Singapore, particularly with respect to the Research, Innovation and Enterprise (RIE) plan. A*STAR’s role in bridging the gap between academia and industry, the public and the private in the area of R&D, through national level initiatives and programmes such as the

<p>National Additive Manufacturing Innovation Cluster. A*STAR’s partnerships with multinational corporations (MNCs), e.g. P&G, GlobalFoundries, on R&D.</p> <p>4. Tour of A*StartCentral (A*SC), an open innovation platform</p>
<p>SIMTech</p>
<p>The Singapore Institute of Manufacturing Technology (SIMTech) is a research institute of the Agency for Science, Technology and Research (A*STAR). SIMTech develops high-value manufacturing technology and human capital to enhance the competitiveness of Singapore’s manufacturing industry. It collaborates with various multinational and local companies in the precision engineering, medtech, aerospace, automotive, marine, oil & gas, electronics, semiconductor, logistics, and other sectors. It is committed to serve the manufacturing industry to develop the industrial, intellectual and human capital.</p>
<p>NAMIC</p>
<p>The National Additive Manufacturing Innovation Cluster (NAMIC) is a national platform led by the Agency for Science, Technology and Research (A*STAR), supported by the National Research Foundation under the Prime Minister’s Office and the Ministry of Trade and Industry, together with Enterprise Singapore and the Singapore Economic Development Board. It is set up under the Innovation & Enterprise (I&E) Cluster Fund - an initiative under RIE2020 aimed at supporting projects catering to address the specific needs of each domain and to help capture value through translation of research to impact.</p>
<p>NAMIC aims to accelerate the adoption of hybrid and digital additive manufacturing technologies under Singapore’s Manufacturing and Economy 2030 Vision, helping industries transform towards innovation and high value-added manufacturing using sustainably sourced, nature-based designs and cradle-to-cradle on-demand manufacturing. NAMIC achieves this by focusing on value capture and creation through an industry sectorial engagement approach, leveraging on public-private partnerships and R&D investments, supporting translational research, and accelerating industry test-bedding towards commercial scale-up. NAMIC continues to grow its international outreach, identifying and supporting deep-tech companies incorporating AM technologies seeking capital injection either through project joint-funding or its investor networks.</p>
<p>A*STAR</p>
<p>The Agency for Science, Technology and Research (A*STAR) is Singapore’s lead public sector agency that spearheads economic oriented research to advance scientific discovery and develop innovative technology. The Agency supports R&D that is aligned to areas of competitive advantage and national needs for Singapore. Through open innovation, it collaborates with partners in both the public and private sectors to benefit society.</p>
<p>As a Science and Technology Organisation, A*STAR bridges the gap between academia and industry. Its research creates economic growth and jobs for Singapore, and enhances lives by contributing to societal benefits such as improving outcomes in healthcare, urban living, and sustainability.</p>
<p>A*STAR plays a key role in nurturing and developing a diversity of talent and leaders in our Agency and research entities, the wider research community and industry. A*STAR’s R&D activities span biomedical sciences and physical sciences and engineering, with research entities primarily located in Biopolis and Fusionopolis.</p>
<p>A*SC</p>
<p>A*StartCentral (A*SC) is an open innovation platform by the Agency for Science Technology and Research (A*STAR). It aims to incubate and accelerate the growth of deep-tech startups, and bolster the startup ecosystem. A*SC fosters interaction between researchers, corporates, startups, investors, and entrepreneurs across diverse disciplines.</p>
<p>Key persons</p>
<ul style="list-style-type: none"> - Prof TAN Sze Wee, Assistant Chief Executive Innovation & Enterprise - Mr Dennis LING, Executive Director, Innovation & Enterprise



PROFESSOR TAN SZE WEE
Assistant Chief Executive
Innovation & Enterprise
A*STAR

Professor Tan's career in A*STAR began in 2009, where he held the appointment of Programme Director of the Medical Technology initiative in the Science and Engineering Research Council (SERC). His next appointment was as Director of SERC's Strategic Initiatives, where he oversaw all SERC cluster-led R&D development. He also provided leadership for SERC's cross-cutting programmes such as the Thematic Research Programme and the Joint Laboratories programme with the local universities and concurrently spearheaded the Healthcare and

Lifestyle Programme in A*STAR.

In October 2012, Professor Tan was promoted to Deputy Executive Director in the Biomedical Research Council (BMRC). His experience with the SERC research institutes enabled BMRC to engage companies in these industry sectors holistically, cross-promoting the multi-disciplinary capabilities available at both Councils to meet the needs of companies. He helped to pave the way for growth of A*STAR's engagements with companies in the Food & Nutrition, Medical Technology and Consumer Care sectors with leading MNCs like GE Healthcare, Nestle, Coca-Cola and P&G.

Professor Tan was appointed Assistant Chief Executive of SERC in January 2016, and this involved directing the SERC research institutes to work closely in the Advanced Manufacturing and Engineering Domain. Together with the universities, public-private partnership models such as the Technology Centre for Offshore and Marine Singapore Ltd (TCOMS) and Advanced Remanufacturing and Technology Centre (ARTC) have been successful in demonstrating its platform to facilitate research capabilities to private industries.

Professor Tan was appointed on May 2020 as the Assistant Chief Executive of the newly established Innovation and Enterprise Group, comprising the Industry Development Group and A*ccelerate Technologies Pte Ltd. As Assistant Chief Executive (I&E), Professor Tan leads the Enterprise Division in steering efforts to translate A*STAR's R&D to market so as to enable research-fuelled economic and social impact.

Professor Tan is Adjunct Professor at Nanyang Technological University's (NTU) School of Chemical and Biomedical Engineering and Lee Kong Chian School of Medicine, as well as an Adjunct Professor at Duke-NUS Medical School Singapore. Professor Tan was a former Nominated Member of Parliament of Singapore, and a recipient of Friend of Labour Award and the Public Administration Medal (Silver).

Professor Tan is an advisory member to the Singapore National Eye Centre's Ophthalmic Technologies Incubator Advisory Board. He is a council member of the Singapore Medical Association (SMA), as well as a board director for SMA Pte Ltd and SMA Charity Pte Ltd. He is the Chairman of Unlocking ADHD Pte Ltd.

Professor Tan graduated with a Bachelor of Medicine and a Bachelor of Surgery from the National University of Singapore (NUS), and attained his Masters of Business Administration from Warwick University, UK. He attended the Stanford Executive Programme at the Stanford Graduate School Business, and was awarded a certificate of completion for the Senior Fellowship in Public Service Programme, Lee Kuan Yew School of Public Policy. Prof Tan also attended the Executive Leadership Programme from the Singapore Civil Service College. He is an affiliate member of the Faculty of Pharmaceutical Medicine, Royal College of Physicians, UK. He is a registered medical practitioner with the Singapore Medical Council and the Hong Kong Medical Council.

Day 3: Wednesday, March 8**Meeting - Economic Development Board**

AGENDA
The role of the Economic Development Board (EDB) in shaping Singapore as an innovation economy and in developing strategies positioning Singapore as a global centre for innovation. How EDB is driving corporate venture building and venture creation in Singapore.
+ Short introduction and sharing about VARIO.
EDB
The Singapore Economic Development Board (EDB), the lead government agency under the Ministry of Trade and Industry, is responsible for strategies that enhance Singapore's position as a global centre for business, innovation, and talent. EDB undertakes investment promotion and industry development, and works with international businesses, both foreign and local, by providing information, connection to partners and access to government incentives for their investments. Its mission is to create sustainable economic growth, with vibrant business and good job opportunities for Singapore.
The Innovation Economy division in EDB is responsible for uncovering and incubating new economic opportunities and to bolster Singapore's value propositions as an innovation ecosystem for companies.
Key persons
<ul style="list-style-type: none"> - Dr CHEN Guan Yow, Vice President, Innovation Economy - Mr CHUA Seng Tat, Assistant Vice President, Innovation Economy - Ms Juliana AU Yun Xiu, Senior Manager, Innovation Economy

Meeting - Enterprise Singapore + IPI Singapore

AGENDA
Singapore's approach to and policies on innovation. The ways by which Singapore connects and catalyses collaborations with other innovation hubs around the world (e.g. through the Global Innovation Alliance), as well as the initiatives to support local enterprises in accelerating their innovation processes through IPI Singapore.
+ Short introduction and sharing about VARIO.
ESG
Enterprise Singapore is a statutory board under the Ministry of Trade and Industry. It was formed to support and champion enterprise development. ESG works with committed companies to build capabilities, innovate and internationalise. It also supports the growth of Singapore as a hub for global trading and startups. As the national standards and accreditation body, ESG continues to build trust in Singapore's products and services through quality and standards. In partnership with the Economic Development Board (EDB), ESG launched the Global Innovation Alliance (GIA) - a network of Singapore and overseas partners in major innovation hubs and key demand markets, with a focus on technology and innovation.
The Innovation & Enterprise division of ESG has a number of strategic foci, including: strengthening Singapore's connections to innovation hubs globally; growing the ecosystem and develop initiatives to help Singapore enterprises innovate; and, encouraging startup development.
Key persons
- Ms Emily LIEW, Assistant Chief Executive Officer / Innovation & Enterprise Services, Enterprise Singapore
IPI Singapore
IPI Singapore, as a subsidiary of Enterprise Singapore (ESG), is an innovation catalyst that creates opportunities for enterprises to grow beyond boundaries. IPI accelerates the innovation process of enterprises through access to its global innovation ecosystem and advisory services. IPI also facilitates and supports enterprises' innovation processes, including commercialisation and go-to-market strategies.
Key persons
- Mr Michael GOH, Chief Operating Officer, IPI Singapore

Michael Goh
 Chief Operating Officer (COO) of IPI

As Chief Operating Officer (COO), Michael leads the development of industry engagement strategies and engage key stakeholders across various sectors. He also drives operational efficiency within IPI by working with various departments to harmonise and manage cross-team activities and organisation-wide initiatives to achieve IPI’s goals. Michael leads a multidisciplinary team of innovation managers who work with enterprises to source for technologies both locally or from abroad; and facilitate partnerships to bring new and innovative products and services to the market. Michael is passionate about sharing his knowledge in intellectual property (IP), IP management and commercialisation gained over 15 years at IPI and previous work experience with Intellectual Property Office of Singapore (IPOS) and ETPL (now A*ccelerate). He has spoken at innovation events as well as conducted training workshops on technology commercialisation and open innovation.

Meeting Duke-NUS Medical School – Eunost Polyclinic

SUMMARY

Eunos Polyclinic – insights in signature research program and some of the innovative projects leveraging on medical technology such as virtual reality.

Eunos Polyclinic

SingHealth Polyclinics (SHP) is a network of nine polyclinics operated by Singapore Health Services (commonly known as SingHealth) - Singapore’s largest group of healthcare institutions and an Academic Medical Centre offering over 40 clinical specialties through a network of acute hospitals, national specialty centres, community hospitals and polyclinics. SingHealth Polyclinics provide comprehensive primary healthcare services to the local population in Singapore and play an integral role in empowering patients and their families to take charge of their health and wellness. Each polyclinic serves about 450-1100 outpatients during office hours in each work day.

Eunos Polyclinic opened in December 2021 and is the latest SingHealth Polyclinic. Aside from providing outpatient medical care and treatment for chronic and acute conditions, Eunost Polyclinic offers women’s and children’s health services, immunisations, diagnostics and dental services, as well as allied health options such as physiotherapy and podiatry. Eunost Polyclinic is also co-located with a senior care centre with 60 day care places, operated by Methodist Welfare Services.

Key persons

- Prof Dr TAN Ngiap Chuan, Director, Research, SingHealth Polyclinics



Dr Ngiap Chuan Tan was appointed as the Director of Research in SHP in October 2012, after serving as Clinic Director of SHP-Pasir Ris from 2002. He graduated with both the Master in Family Medicine and Master in Clinical Investigations (NUS) and is a Fellow of the College of Family Physicians of Singapore. Dr Tan is a sub-editor of the journal “Proceedings of the Singapore Healthcare” and serves as a reviewer for various local and international medical journals and grant applications.

Dr Tan focuses on person-centered care and ageing related research. He is also passionate in the development of mobile applications, serious games and virtual reality in primary healthcare setting. He has published over 80 articles in local and international medical journals such as SMJ, ERJ, npj PCRM, Lancet Respiratory Medicine, Medicine, Family Practice, JMIR, JAMDA and JAMA.

Dr Tan is a facilitator for the in-house research training and runs basic and qualitative research workshops regularly for the multidisciplinary staff in SHP and FM ACP. He coaches medical students and novice primary care researchers via platforms such as Research Master Hour and Research Consultation Clinics in SHP and FM ACP. He also mentors the SHP and FM ACP Fellowship trainees in the College of Family Physicians of Singapore.

Dr Tan has secured research grants from public and private funding agencies such as Singapore National Medical Research Council, Mitsui Sumitomo Insurance Welfare Foundation, Abbott Laboratories and others to support his fields of research. He also collaborates with local academic institutions, including Institute of Technical Education, Polytechnics, local universities, SingHealth institutions and other ACP. A/P Tan is a key member of the SingHealth consortium which has recently been awarded the AI-SG Grant, leveraging on artificial intelligence to develop predictive risk model and to enhance evidence-based person-centered care.

Day 4: Thursday, March 9

Meeting – SGIInnovate

AGENDA

Introduction and overview of SGIInnovate and its roles: as an innovation platform, to catalyse and crowd-in funding for early-stage deep tech investments, talent development. In-depth look at the role of SGIInnovate in the Singapore innovation ecosystem and startup ecosystem. SGIInnovate's global partnerships to grow the Deep Tech community and support open innovation activities.

+Introduction and overview of VARIO and its roles, including the focus areas (industry, technology, etc). Experiences and strategies in attracting and retaining top international talent and creating value for stakeholders.

SGIInnovate

SGIInnovate is a government-owned innovation platform in Singapore to support entrepreneurship centred on the development of deep technology. It helps entrepreneurs launch, prove & scale deep tech products borne out of science research. SGIInnovate also manages a portion of the funds under Startup SG Equity, a government and private co-investment scheme that provides equity investments to tech startups.

Key persons

- Dr LIM Jui, Chief Executive Officer
- Ms Desiree TUNG, Deputy Director, Partnerships
- Ms Gin SUM, Assistant Director, Community & Partnerships



Dr Lim Jui
CEO, SGIInnovate

As CEO of SGIInnovate, Dr Lim Jui has overall leadership of the organisation that is committed to helping entrepreneurial scientists build and scale Deep Tech startups. At SGIInnovate, Jui and his team work closely with a wide range of partners and co-investors to back this unique group of founders, who are looking to solve global challenges with their research-based solutions. This is done through equity-based investments, access to the Deep Tech ecosystem and talent network, as well as by providing business-building support.

While he trained in medicine, Jui had spent most of his professional life in the business of science and innovation. He was Director of Investments, Bio*One Capital; CEO of

Merlin MD, a medical device company; Executive Director of the Medical Engineering Research and Commercialisation Initiative (MERIC) at the National University of Singapore (NUS); and Programme Director of the Singapore-Stanford Biodesign Programme (SSB), a joint venture between the Agency for Science, Technology and Research (A*STAR), the Singapore Economic Development Board (EDB) and Stanford University. Before joining SGIInnovate, Jui was CEO of NTUitive, the innovation and enterprise company of the Nanyang Technological University (NTU).

He currently serves on the advisory boards of IPOS International, the business arm of the Intellectual Property Office of Singapore (IPOS), and several startup companies. He was previously a board member of the Building and Construction Authority (BCA) in Singapore.

Jui received his Bachelor of Arts (BA, Biological Sciences and East Asian Studies) and Doctor of Medicine (MD) at Columbia University. He then obtained his Master of Medicine (Anaesthesiology and Surgical Intensive Care) from NUS. He remains a registered medical practitioner today.

Visit - Environmental & Water Technology Centre of Innovation (EWTCOI)

AGENDA
Looking at how Centres of Innovation (COIs) take a sector-specific and multidisciplinary approach to supporting innovation priorities of enterprises.
EWTCOI
<p>The Environmental & Water Technology Centre of Innovation (EWTCOI) was set up in October 2006 as a strategic collaboration between SPRING Singapore (SPRING) (now known as Enterprise Singapore) and Ngee Ann Polytechnic (NP). It is one of eleven Centres of Innovation set up in partnership with selected polytechnics and research institutes and is designed to be a industry-specific one-stop hub providing an array of ready resources that small and medium enterprises (SMEs) looking to embark on technology innovation can tap on. Its mission is to partner strategic industry sectors in applied R&D and consultancy projects to translate ideas into practical solutions or innovations for a sustainable environment.</p> <p>EWTCOI serves to bridge a gap in the industry where companies who seek practical and market-driven technology solutions can tap on the Centre’s expertise and resources in four focus areas namely Water, Sustainable Materials, Energy Efficiency and Membrane Technology.</p> <p>The EWTCOI team has multi-disciplinary capabilities ranging from environmental & water engineering, chemical engineering, molecular microbiology, mechanical engineering, electrical engineering, electronic engineering, material science engineering and chemistry.</p>
Key persons
- Mr Jason TANG, Director

Meeting - Nanyang Technological University (NTU)

AGENDA
Meeting with Nanyang Technological University (NTU) to learn of its five-year strategic plan, detailing the University’s education, research and innovation ambitions and goals. NTU’s approach to engagement with industry, entrepreneurship and innovation.
NTU
<p>The Nanyang Technological University is a national research university in Singapore. It is the second oldest autonomous university in the country and is considered as one of the most prestigious universities in the world by various international metrics. NTU is ranked 19th in the world according to the 2023 QS World University Rankings, and has also been ranked 1st globally amongst young universities by the QS World University Rankings since 2015.</p> <p>A research-intensive public university, Nanyang Technological University, Singapore (NTU Singapore) has 33,000 undergraduate and postgraduate students in the Engineering, Business, Science, Medicine, Humanities, Arts, & Social Sciences, and Graduate colleges.</p> <p>NTU is also home to world-renowned autonomous institutes – the National Institute of Education, S Rajaratnam School of International Studies, Earth Observatory of Singapore, and Singapore Centre for Environmental Life Sciences Engineering – and various leading research centres such as the Nanyang Environment & Water Research Institute (NEWRI) and Energy Research Institute @ NTU (ERI@N).</p>

The JURONG INNOVATION DISTRICT comprises 5 distinct precincts, forming an ecosystem of corporations and partners:



Key persons

- Prof Timothy WHITE, Vice President, International Engagement
- Ms Wanda PREISER, Head, Office of International Engagement
- Ms YIN Su Maw, Manager, Office of International Engagement



Prof Tim WHITE

Tim White received his PhD from the Australian National University in mineral chemistry and crystallography. He is presently Vice President (International Engagement) and the President's Chair in Materials Science and Engineering at Nanyang Technological University. During his career he has held leadership posts at the Australian National University (Canberra), Institute of Environmental Science and Engineering (Singapore), the University of South Australia (Adelaide), University of Queensland (Brisbane), the University of Melbourne, and the Australian Nuclear Science and Technology Organisation (Sydney). Secondments have included the Institute for Transuranium Elements (Germany), Japan Atomic Energy Research Institute and The University of New Mexico (US). His research awards include the Cowley-Moodie Award for Electron Microscopy and a Senior Fulbright Fellow, and an Asia Fellowship. He was President of The Australian Microscopy and

Microanalysis Society (2010-2013), and since 2020 been President of the Materials Research Society - Singapore.

Visit - Singapore Centre for Environmental Life Sciences Engineering

AGENDA

Presentation on Singapore Centre for Environmental Life Sciences Engineering (SCELSE) with posters about the work being done as well as a tour of the facilities (which include some of the most sophisticated Life Science imagery infrastructure).

SCELSE

Singapore Centre for Environmental Life Sciences Engineering (SCELSE), launched in April 2011, is a joint venture between NTU and NUS, and is hosted in NTU. It is one of the five Research Centres of Excellence

(RCE) established by The National Research Foundation (NRF) and the Ministry of Education (MOE) to spur research excellence in the local universities.

SCElse aims to take a multidisciplinary approach to discover, control and direct the behavior of biofilm communities for sustainable environmental, engineering, public health and medical applications. This is enabled through its strengths in analysis of complex microbiomes, using advanced computational biology and cutting edge facilities in genome sequencing, bio-imaging and bioreactor processes. The Centre has about 200 people and is one of four centres of excellence in Biofilms and Microbiome in the world (the other three are located in the US, UK and Denmark respectively).

Key persons

- Mr Michel BIRNBAUM, Director, Entrepreneurship and Research Translation

Day 5: Friday, March 10**Visit PSA International****AGENDA**

Briefing on PSA. Visit to the PSA Innovation Centre (PIC) - an experiential, multimedia showcase of PSA's next-generation port and wider supply chain ecosystem.

PSA

PSA International (PSA), a leading port group, operator and supply chain company, with flagship operations in Singapore and Antwerp. The Group's portfolio comprises over 60 deepsea, rail and inland terminals, as well as affiliated businesses in supply chain management, logistics, marine and digital services. PSA's global network encompasses 160 locations in 42 countries around the world.

PSA Singapore operates the world's largest container transshipment hub in Singapore, with unrivalled connectivity, facilitating container movements across the world, 24/7 all year round. Beyond port operations, PSA also co-creates cargo solutions and digital platforms to empower customers with actionable intelligence. PSA offers cargo solutions to customers operating in advanced manufacturing, cold chain, e-commerce, and energy & chemicals. As an enabler of global trade, PSA energises economies, empowers communities, and innovates for more agile, resilient, and sustainable supply chains.

Key persons

- Mr Matthias DE SAEDELEER, Assistant Vice President, Group Commercial Department
- Mr Mark SØRENSEN, Senior Manager, Group Corporate Affairs

**Meeting - Embassy of Belgium in Singapore
& Closing Lunch with external participants - OTTO Ristorante**

AGENDA

Meeting with the Ambassador to share and discuss observations from the various visits.

EMBASSY

Belgium is represented in Singapore by the Embassy of Belgium in Singapore. The Embassy maintains diplomatic relations between Belgium and Singapore and provides consular services to citizens living in and traveling to Singapore. The Embassy in Singapore also hosts the offices of all three regional trade authorities - Flanders Investment and Trade (FIT), hub.brussels and Walloon Export and Foreign Investment Agency (AWEX).

Key persons

- HE Ms Colette TAQUET, Ambassador of Belgium to Singapore

COLETTE TAQUET
AMBASSADOR TO SINGAPORE
KINGDOM OF BELGIUM

Prior to her accreditation to Singapore, Ambassador Colette Taquet was Director in the General Directorate of European Affairs in the Belgian Federal Public Service Foreign Affairs (FPSFA). She had worked on issues such as the reform of legislation on migration and asylum legislation, COVID-19 crisis management, matters related to the security and free movement of people in the European Union, as well as legislation on the fight against online terrorist content, the protection of whistle blowers and recognition of e-evidence.

Ambassador Taquet has held several positions at the Belgian FPSFA, including as Belgium's Ambassador to Cyprus, Lebanon, as well as Poland and Lithuania.

Ambassador Taquet has a degree in Political Science and a specialisation in International Law from Université Libre de Bruxelles (Free University of Brussels). She holds the Medal of the Commander of Leopold's Order (Kingdom of Belgium) and the Medal of Commander of the Order of Merit (Republic of Poland).

Meeting - DEME + Jan De Nul

AGENDA
Presentation on DEME and Jan De Nul, its history in Asia Pacific and Singapore, and sharing on experiences of working on projects in Singapore.
DEME
Dredging International Asia Pacific is part of the DEME Group, a Belgian Marine & Waterway Contractor and one of the world's largest dredging companies in the world. Apart from dredging they focus on offshore energy market, environmental works and marine infrastructure. DEME employs more than 5000 people globally and it has a regional office in Singapore.
Key persons
- Jorim VANDEVOORDE, Tender Manager, Dredging International Asia Pacific
JDN
Jan De Nul Group is a Belgian family-owned company, with the financial headquarters in Luxembourg, that provides services relating to the construction and maintenance of maritime infrastructure on an international basis. In Singapore, Jan De Nul has worked on the Jurong Island and Tuas Extension reclamation projects.
Key persons
- Martin HARMS, Regional Director, Asia Pacific Office, Jan De Nul