Photo by CHUTTERSNAP on Unsplash

EV Singapore in the making: Technologies & Challenges

PDUs for PEs and CEngs (to be confirmed)

IES has brought together experts who will share on how Singapore is gearing towards a city where everyone can enjoy the benefits of an electric vehicle (EV). Join us at SIT@SP Building (in-person) and Zoom (virtual) to discover how the eco system is in the making, the operations of EVs and their challenges.

9.00 AM - 4.00 PM

19 AUGUST 2022, FRIDAY

SIT@SP Building
LT6C, Level 6
Singapore Polytechnic
510 Dover Road, Singapore 139660

Please click here
or scan QR code to register

IES / CEng Members

In-Person*: S$ 85.60 per pax

Virtual: S$ 53.50 per pax

Non-members

In-Person*: S$ 107.00 per pax

Virtual: S$ 74.90 per pax

Price inclusive 7% GST

**Each in-person registration includes morning tea break and lunch.*

Organised by
Outreach Sub-Committee,
Railway and Transportation
Engineering Technical Committee

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Mr Mark Tan
Head, National Electric Vehicle Centre,
Land Transport Authority (LTA) Singapore

Singapore's EV Masterplan 2022: Driving Towards Mass Adoption

Singapore is driving towards wider EV adoption to meet our 2040 Clean Energy Vehicle Vision, and the National Electric Vehicle Centre had been formed to coordinate the Government's plans in addressing the following:

- Accelerating EV charging infrastructure
- Building EV regulations and standards
- Cultivating a robust EV ecosystem in Singapore

Mr Jung Hong Bum
Chief Executive Officer,
Hyundai Motor Group Innovation Centre,
Singapore

Creating the Mobility Ecosystem in Singapore

The Hyundai Motor Group Innovation Centre in Singapore (HMGICS) will revolutionise the future of mobility as the global innovation hub for the Hyundai Motor Group to testbed and commercialise new technologies and business models. While other OEMs place an importance on their supplier ecosystem, HMGICS will catalyse the formation of a unique automotive ecosystem in Singapore spanning the entire value chain from research & development, manufacturing, new business models and open innovation.

Mr Goh Chee Kiong
CEO,
Charge+

EV Charging: Cracking the Chicken-and-Egg Conundrum for EV Adoption

Electric vehicle adoption is scaling rapidly in Singapore and the world but one major obstacle remains the lack of charging infrastructure. Therefore EV charging operators (EVCOs) play a vital role in the EV ecosystem. Chee Kiong will speak about the different types of EV charging technologies and standards, and how Singapore is spurring investments into EV charging infrastructure to give confidence to prospective EV buyers. He will also talk about the trade-offs between slow and fast charging, and emerging technologies such as battery swap and vehicle-to-grid. The presentation will also cover the capabilities and skillsets needed for the green jobs being created in the EV ecosystem.

Mr Roderick Chia
Chief Strategy Officer |
Chief Technology Officer,
Oyika

Battery Swapping - Lowering the Barriers to EV Adoption

A battery swapping solution converts capital expenditures (CapEx) to operating expenses (OpEx), hence, reducing the upfront cost for EV purchase. There are very complex technical, economic and business model consideration to enable battery swapping solution as a viable option over direct EV charging. Roderick shall share, from a system thinking approach, what are needed to put everything together.

ION Mobility: Combining Design and Tech for a Sustainable Future

ION Mobility has a vision to create sustainable mobility solutions for Southeast Asia. Founded and headquartered in Singapore, learn about how ION combines design, technology, and engineering to create an electric motorbike for SEA's urban populations.

Mr Wu Xianyi
Chief Product and Design Officer, Ion Mobility

Leading the Charge in the Electrification Journey

Electric Vehicles (EV) are the future of transportation and as one of the few pioneering public EV charging operators, ComfortDelGro ENGIE (CDG ENGIE) is excited to be a part of the electrification journey towards Singapore Green Plan 2030. In less than a year, CDG ENGIE has successfully deployed over 100 EV charging points, with the aim of creating an accessible EV charging network to accelerate the adoption of EVs nationwide.

General Manager of CDG ENGIE, Mr Freddie Chew, will share the experience and challenges of bringing EV charging points nearer to users, and how EV charging can become a way of life.

Mr Freddie Chew
General Manager, CDG ENGIE

Plug-in EV Charging Technologies

Developing adequate EV charging infrastructure to cater to the rising demand for EVs on the road is the need of the hour. EV automakers are focusing on long-range battery vehicles while the Government agencies are investing in enhancing the EV charging infrastructure keeping in mind the range anxiety. Electric vehicles require compact EV charging solutions that ensure faster and on-demand charging and robust connectivity to support EVs' current and future needs. The EV charging can be classified into Level-1 (residential), Level-2 (public) and Level-3 (Fleet) charging based on the speed of charging and so the charger capacity. Level-3 chargers are fast DC chargers that can recharge the battery within 30 minutes. This session will present innovative power electronics technologies for different types of EV chargers.

Dr Akshay Kumar Rathore
Professor (Engineering), Singapore Institute of Technology

Business Model Driven EV Charging Innovation

While drivers of vehicles with combustion engines stop to refuel their cars, drivers of electric vehicles stop for other reasons and expect to refuel their cars in the background. At the same time, EV charging points can be easily installed in commercial and domestic areas. This gives on one hand the opportunity to integrate EV charging in a number of business models. On the other hand, the increasing energy demand from charging requires intelligent energy distribution. So how to bring together demand and supply in the most intelligent way?

NTT DATA answers this question from their 10+ years' experience of in the EV charging market.

Mr Oliver Koeth
Chief Technology Officer, NTT Data

Mr Alan Quek
Director and
General Manager,
Willers Pte Ltd (Singapore)

A Seamless Journey Transiting from Managing Conventional Vehicles to Greener Electric Mobility?

Singapore has developed and launched its SG Green Plan 2030, a whole-of-nation movement to advance Singapore's national agenda on sustainable development in 2020. It charts the ambitious and concrete targets over the next 10 years, strengthening and reinforcing Singapore's commitments under the UN's 2030 Sustainable Development Goals (SDG) and Paris Agreement, and positioning Singapore to achieve our long-term net zero emissions aspiration as soon as viable. Under the plan, there is a strong emphasis on the use of cleaner energy vehicles such as electric vehicles (EV).

Many organisations have since embarked on this sustainability journey, especially in the push for more EVs and charging stations to be introduced and deployed in Singapore. Transport operators are also gradually transiting their fleet of vehicles (taxis, buses, etc) to electric. Whilst these EVs have the potential to reduce carbon emissions and create a more liveable and sustainable environment, was it a rosy and seamless journey in this transition to operating a fleet of electric vehicles?

Willers will share about our experience in operating our fleet of electric-driven IKE buses in Japan and autonomous vehicles in Singapore.

Mr Joe Yang
Lecturer,
School of Electrical &
Electronic Engineering
Singapore Polytechnic

EV Education and Technology Development

Singapore Polytechnic (SP) has been actively involved in the EV education and technology development since 1997. SP was teamed up with Trans Island Bus Service and Green Fuel Resources and converted a 19-seater diesel-engine-driven bus into an electric-driven bus. Today, SP is leading in autonomous electric vehicle development, offering EV courses for full-time students, corporates and public. In this seminar, the speaker will share SP in-house EV technology development, EV charging solutions, Industry collaboration and the future mobility.

Programme (AM session)

Time	Topic
9.00am - 9.05am	Opening Address *Mr Lew Yii Der* *Chairman, Railway and Transportation Engineering Technical Committee*
9.05am - 9.30am	Singapore's EV Masterplan 2022: Driving Towards Mass Adoption *Mr Mark Tan* *Head, National Electric Vehicle Centre, Land Transport Authority (LTA) Singapore*
9.30am - 9.55am	Creating the Mobility Ecosystem in Singapore *Mr Jung Hong Bum* *Chief Executive Officer, Hyundai Motor Group Innovation Centre, Singapore*
9.55am - 10.20am	TEA BREAK
10.20am - 10.45am	EV Charging: Cracking the Chicken-and-Egg Conundrum for EV Adoption *Mr Goh Chee Kiong* *CEO, Charge+*
10.45am - 11.10am	Battery Swapping - Lowering the Barriers to EV Adoption *Mr Roderick Chia* *Chief Strategy Officer | Chief Technology Officer, Oyika*
11.10am - 11.35am	ION Mobility: Combining Design and Tech for a Sustainable Future *Mr Wu Xianyi* *Chief Product and Design Officer, Ion Mobility*
11.35am - 12.05pm	*Panel Discussion and Q&A Session (Part 1)*
12.05pm - 12.10pm	*Presentation of Certificates to Speakers (Part 1)*
12.10pm - 1.10pm	*LUNCH*

**The programme may be subject to change without prior notice.*

Programme (PM session)

Time	Topic
1.10pm - 1.35pm	Leading the Charge in the Electricification Journey *Mr Freddie Chew* *General Manager, CDG ENGIE*
1.35pm - 2.00pm	Plug-in EV Charging Technologies *Dr Akshay Kumar Rathore* *Professor (Engineering), Singapore Institute of Technology*
2.00pm - 2.25pm	Business Model Driven EV Charging Innovation *Mr Oliver Koeth* *Chief Technology Officer, NTT Data*
2.25pm - 2.50pm	A Seamless Journey Transiting from Managing Conventional Vehicles to Greener Electric Mobility? *Mr Alan Quek* *Director and General Manager, Willers Pte Ltd (Singapore)*
2.50pm - 3.15pm	EV Education and Technology Development *Mr Joe Yang* *Lecturer, School of Electrical & Electronic Engineering, Singapore Polytechnic*
3.15pm - 3.45pm	*Panel Discussion and Q&A Session (Part 2)*
3.45pm - 3.50pm	*Presentation of Certificates to Speakers (Part 2)*
3.50pm	*END*

**The programme may be subject to change without prior notice.*

About the Speakers (1/2)

Mr Mark Tan
Head, National Electric Vehicle Centre,
Land Transport Authority (LTA) Singapore

Mark heads the National Electrical Vehicle Centre at Singapore's Land Transport Authority. He holds a concurrent appointment as Deputy Group Director, Technology & Industry Development Group at the Land Transport Authority. Formed in March 2021, the NEVC serves as a one-stop programme office to drive EV adoption through planning for EV charging infrastructure; setting of regulations and standards; and cultivating a vibrant EV industry and research eco-system. Mark has previously worked in various areas of government as a trade diplomat, urban planner, and community organiser.

Mr Jung Hong Bum
Chief Executive Officer,
Hyundai Motor Group Innovation Centre, SG

Mr Jung has been CEO of HMGICS since its inception in April 2020. Prior to his current role, Mr Jung led the feasibility study team at Hyundai Motor Group to select the location for the Group's first-in-the world innovation centre. He has been with the Group for over 21 years, starting his career as a research engineer before serving in various management roles including Head of Hyundai's Pilot Centre division. Mr Jung holds a bachelor's degree in mechanical engineering from Yonsei University.

Mr Goh Chee Kiong
CEO,
Charge+

Goh Chee Kiong is the CEO of Charge+, a leading electric vehicle charging solution provider serving Singapore and Southeast Asia. As the green mobility arm of Sunseap Group, Charge+ is rapidly scaling up the EV charging infrastructure to realise its corporate target of 10,000 charging points by 2030.

For the three years prior to joining Charge+ in 2020, Chee Kiong served as the CEO for New Energies in SP Group, responsible for developing energy solutions businesses spanning renewables, energy storage, microgrids, energy efficiency and electric mobility.

Chee Kiong's first career was with the Singapore Economic Development Board (EDB) where he served for two decades and led the development of the cleantech, urban solutions, infrastructure and industrial solutions sectors in Singapore. In 2014, Chee Kiong received the Public Administration Medal (Bronze) for his public service.

Chee Kiong currently sits on the board of the Energy Studies Institute (ESI) and is also the Treasurer of The EDB Society.

Chee Kiong received his Bachelor of Chemical Engineering from the National University of Singapore.

Mr Roderick Chia
Chief Strategy Officer | Chief Technology Officer,
Oyika

Roderick Chia is an Inventor, Educator, Entrepreneur, and Investor. He is the Venture Partner of Raw Ventures and concurrently the Chief Strategy Officer & Chief Technology Officer of Oyika, and is instrumental in architecting the technology roadmap and development for the company. In his spare time, he teaches at Nanyang Technological University on the subjects of Innovations & Entrepreneurship for undergraduates as well as for Train-the-trainer programmes for various tertiary institutions. In 2009, Roderick was conferred Nanyang Outstanding Young Alumni Award by NTU.

Mr Wu Xianyi
Chief Product and Design Officer,
Ion Mobility

Xianyi is an entrepreneur with a broad range of experience in the design and product creation spectrum. He graduated from Carnegie Mellon and Stanford University with a Masters in Mechanical Engineering. While at the d.school at Stanford University, he co-founded d.light, a for-profit social enterprise that produces solar light and power products for the 2 billion people who live without access to reliable electricity. Having worked on warehouse robotics to fintech products, Xianyi is currently leading the product and design teams at ION Mobility, designing electric motorbikes for Southeast Asia.

Mr Freddie Chew
General Manager,
CDG ENGIE

Freddie has almost 20 years of holistic experience in the transportation sector, including public transport operations, supply chain and car park operations. He has successfully led new business initiatives like an industry-first accident response team and expanded businesses successfully into new service offerings. He was instrumental in leading the team that won the pilot tender to install close to 500 charging points at public car parks in the eastern, western and central regions of Singapore.

About the Speakers (2/2)

Dr Akshay Kumar Rathore
Professor (Engineering),
Singapore Institute of Technology

Akshay Kumar Rathore (IEEE Fellow) is a Full Professor at Singapore Institute of Technology, Singapore and is an expert in power electronics and control of electrical motor drives. He supervised 11 PhD theses and 14 MASc (research) theses on novel power electronic converter design for solar, fuel cells, marine, more electric aircrafts, electric vehicles charging (grid and solar based plug-in and wireless), and motor drives applications. He has one approved European Patent commercialized by WEG Brazil and developed above 99% neutral-point-clamped multilevel inverter based medium voltage drive system. He is a recipient of the 2013 IEEE IAS Andrew W. Smith Outstanding Young Member Achievement Award, 2014 Isao Takahashi Power Electronics Award, 2017 IEEE IES David Irwin Early Career Award, 2020 IEEE Bimal Bose Award for Industrial Electronics Applications in Energy Systems and 2021 Nagamori Award. He published about 285 research papers in international journals and conferences, including 96 IEEE Transactions and co-authored 3 book chapters. He served as the distinguished lecturer (2017-18) and prominent lecturer (2019-21) of the IEEE IAS society. He is serving as the Chair of the IEEE IAS Renewable and Sustainable Energy Conversion Systems Committee. He led and chaired the IEEE IAS Industrial Automation and Control Committee (2018-19) and IEEE IES Technical Committee on Transportation Electrification (2016-17).

Mr Oliver Koeth
Chief Technology Officer,
NTT Data

Oliver Koeth is Chief Technology Officer (CTO) for the DACH Region (Germany, Austria, Switzerland) at NTT DATA. Oliver joined NTT DATA in 2002 as Software Architect and was working in international system integration projects in NTT DATA's global automotive practice. As CTO Oliver advises clients on issues relating to new technologies in the areas of cloud, internet of things, customer experience, artificial intelligence, and cyber security and brings in the expertise of NTT DATA's global technology and innovation portfolio. He is also responsible for the EV charging asset of NTT DATA. In 2017 Oliver co-founded Ensō - The Space for Creators, the first co-creation space of NTT Group in EMEA. The Ensō combines human-centered design with a deep understanding of technology to co-create desirable futures with NTT Group customers. Oliver read computer science at Technische Hochschule Nürnberg, graduating 1997 and holds an MBA from University of Lincoln (UK).

Mr Alan Quek
Director and General Manager,
Willers Pte Ltd (Singapore)

Alan is an Engineer by training and is a Chartered Engineer with IES since 2019. He has been in the industry for 24 years where he spent 15 years in the public sector with the Land Transport Authority (LTA) focusing on delivering Intelligent Transport Systems (ITS).

Currently, a Director and General Manager with WILLERS Pte Ltd, Alan is responsible for the business development, marketing and operations in the Asia Pacific region, delivering new sustainable mobility services, including operations of autonomous vehicles and on-demand shared mobility solution.

Alan is very active in the international ITS community and has served as the ITS Singapore Secretary from 2015 to 2020 and is currently an elected Council member. He was also a key member in the Organising Committee for the 2019 ITS World Congress that was held in Singapore.

Mr Joe Yang
Lecturer, School of Electrical and Electronic Engineering
Singapore Polytechnic

Mr Joe Yang is a Lecturer with the School of Electrical and Electronic Engineering of Singapore Polytechnic. He has developed and taught modules related to Future of Mobility (Electric Vehicles), Industrial Internet of Things (In the areas of Smart Sensors & Actuators, PLC & IPC, M2M and SCADA) and Urban Farming Solutions.

For the industries and the public, Joe has conducted courses and webinars in the areas of Industrial Internet of Things, Smart Urban Farming Solutions, OPC UA for Advanced Manufacturing, Cybersecurity, Cloud Computing, Data Analytics and Artificial Intelligence. Recent years, Joe is actively involved with SP Driverless Electric Vehicle and Urban-Sustainability Solutioning projects.