



Final Program

23rd IERE General Meeting and Singapore Forum

**Accelerating the Carbon-Neutral Energy Transition
for Industry and Territories**

In-Person Event



Marina Bay, Singapore

Singapore
November 21–24, 2023

Organized by ENGIE and IERE

Message from IERE Chair

I invite you all to the IERE Singapore Forum which will take place between November 21 and 24, 2023. Co-hosted by ENGIE, the forum's theme is "Accelerating the Carbon-Neutral Energy Transition for Industry and Territories".

Even though world political and economic conditions are increasingly difficult and unforeseeable, we need to accelerate our efforts to achieve carbon neutrality as fast as possible. Renewable energy is key to the solution. However, we must consider challenges such as intermittent power generation, limitations to control, and the discrepancy between where people live and where renewable energy is abundantly available at a low cost. For these reasons, we need to develop a wide array of solutions, including the use of green hydrogen, CCS, energy storage, transmission system enhancements, and innovation in power systems and demand-side control. In addition to these technical matters, we have to consider economic, social and environmental aspects.

The situation differs from country to country, requiring specific approaches. That is why experts across the world need to cooperate and exchange information and insights. In this forum, we foster discussion among attendees and provide ample time for debate during presentations, Q&A sessions, and breakout sessions. I invite you to join this worldwide discussion.

During the forum, you can also join the 23rd IERE General Meeting where we present and discuss IERE's activities of the past year. Special attention will be given to the new IERE "Technology Foresight 2023" report, which discusses the technologies that IERE believes will have the biggest impact on electric power industries around the year 2030. The report also outlines the current state of these technologies.

Singapore is a unique business hub in Asia where people from various countries gather, communicate and cooperate. It is therefore a great place for this forum and general meeting. I firmly believe that the event will be fruitful to all of you as it will help to promote the path to carbon neutrality.

Finally, I would like to express my deepest gratitude and appreciation to ENGIE for co-hosting and organizing this IERE General Meeting and Singapore Forum.

I am looking forward to meeting and discussing with you in Singapore.



MINO Yoshiaki

IERE Chair
CRIEPI, Japan

Message from ENGIE

Accelerating the ‘and’ of the carbon neutral energy transition

The interesting thing about energy discussions is that one does not need to have expertise in the field to have a strong opinion. Reason of course is that energy is so present in our daily lives; and in fact is critical to society. Energy enables a high quality of life and if properly done, makes humans healthy, wealthy and free. In fact, it enables our access to clean water and healthy food as well. In many of these entertaining energy discussions, people seem to dominantly think in opposing ideas: nuclear or gas turbines to complement intermittent renewable electricity production, electricity or gas to produce heat, Li-ion batteries or Redox flow batteries for grid stabilisation, electricity or hydrogen mobility, biogas or synthetic natural gas. At ENGIE we believe these discussions should no longer oppose technologies but focus on where and how these technologies can complement each other. Moreover, the time for acceleration on all these technologies has come if we want to reach our ambitious climate targets of staying well below 2 degrees.

One of the most famous discussions is **whether** in the future, mobility will use electricity, hydrogen, biogas or synthetic gaseous or liquid hydrocarbons as its fuel? The question already implies one would have to make choice whereas a more correct question would rather be: **where** will in the future, mobility be fueled using electricity, hydrogen, biogas or synthetic hydrocarbons? Another interesting ‘OR’ debate is whether we should electrify or gasify our industry as we move towards a carbon neutral world. At ENGIE we believe we should do both and both simultaneously. Electricity has some important advantages over gas and turning electricity into gas reduces efficiency and increases costs. However, we may need to pay this price to make energy storable over longer periods or make it more energy dense to transport and use existing transport and usage infrastructure. In fact, when introducing technologies such as P2G (Power to Gas) and P2G2P (Power to Gas to Power), the distinction between electricity and gas becomes very small and both are easily converted back and forth. So as such the discussion whether we should electrify or gasify makes little sense since we need to accelerate on both!

Finally, it remains difficult to predict the possible impact of game changing technologies, that will for sure pop up in the coming years, will have on the zero-carbon energy transition. Engie is committed to **co-develop** these emerging technologies using pilots and demos with partners to help the much needed acceleration. Apart from the environmental and economic aspects of new technologies, the support of the citizens is crucial. The social acceptance and consequent adoption of new technologies will (co-)determine whether a technology will breakthrough. The energy transition will therefore be an ‘AND’ story along two axes: (i) we will need many emerging ‘sustainable’ technologies; there is not one that has the potential to overcome the challenge alone and (ii) the challenge is too large to overcome alone as a person/company/sector, we must collaborate. Join us in our journey to accelerate towards a carbon neutral energy transition.



Jan MERTENS

**Chief Science Officer
ENGIE**

Accelerating the Carbon-Neutral Energy Transition for Industry and Territories

About the theme

Energy enables a high quality of life and if properly done, makes humans healthy, wealthy and free. In fact, it enables our access to clean water, healthy food and transport as well.

Today, the global energy sector is strongly relying on fossil-based energy. But energy transition is a pathway toward transformation to net zero-carbon emissions by the second half of this century. At its heart is the need to reduce energy-related CO₂ emissions to limit climate change. Renewable energy and energy efficiency measures can potentially achieve 90% of the required carbon reductions (IRENA, 2020).

However not only do these renewable solutions have to answer 3 effectiveness requirements: economical, social and environmental; there is also a discrepancy between where people live and where cheap abundant renewable energy is available. In addition, the intermittency of renewables has to be taken into account.

It is therefore without a doubt that when switching to a net zero-carbon emission world, enormous amounts of renewable energy will need to be transported. High Voltage Direct Current (HVDC) electricity transmission lines will be a part of the solution but as distance increases, other transport modes will come in play. Converting the electricity into an energy carrier such as hydrogen, ammonia or synthetic hydrocarbons will be required.

As for the intermittency, the development of information and data management technologies should ensure that the ensemble operates in a stable and reliable manner. Demand side management systems must ensure that the supply and demand of energy match and storage solutions will play in crucial role in this.

Who should attend?

The Forum is intended for experts involved in the selected themes, from IERE members and non-members, as well as all those interested in the evolution of the energy transition and the technology development and business development opportunities associated to this evolution. ENGIE & IERE will invite prominent speakers for keynote speeches.

Schedule Outline:

| | | |
|-----------|-------------------|--|
| Tuesday | November 21, 2023 | Registration and Welcome Reception (In the evening) |
| Wednesday | November 22, 2023 | 23rd IERE GM & Singapore Forum (Day 1), Official Dinner |
| Thursday | November 23, 2023 | 23rd IERE GM & Singapore Forum (Day 2), Social Event (Optional) |
| Friday | November 24, 2023 | Technical Tour (Optional) |

Program and Session Themes

Session structure and speakers may be subject to change according to the submission of contributions.

November 21, 2023

Registration and Welcome Reception

November 22, 2023

Plenary Session – WHAT

Opening Address: IERE Chair

Welcome Speech: ENGIE

Plenary Session – HOW in APAC

Government's Point of View for Singapore

Innovations in APAC

ENGIE's Ambition in APAC

SHARE & PULL Workshops

Session A

Theme: Making Business Out of It

Entering new segmenting markets can be complex especially in a moving and accelerating context. How does one bring the different actors together?

Potential topics include:

- Multi-OEMs projects and REX (Return of Experience)
- Venturing projects and REX

- Industrial symbiosis set-up and approach
- R&D funded projects (National, Regional, , ...) and approach
- Entering new segmenting markets (Asian, African, European, Residential, Centralized, Decentralized, Aggregation...)
- ...

+ Question and Answer session after each presentation

Session B

Theme: Regulatory & Public Acceptance

By-in of Regulatory and Public are becoming crucial to winning projects.

Potential topics include:

- The evolution of regulatory issues
- Integration of public dialogue in new projects (REX)
- Projects involving grid autonomy : Local Energy Communities, Community ventures, etc. (REX)
- Projects with Crowd funding (REX)
- Projects with new requirements and constraints : e.g. LCA, hand-print etc.
- Best practices to enable co-funded projects (national, regional, etc.)
- ...

+ Question and Answer session after each presentation

Theme: How to Accelerate Learning by Doing?

Derisking of new technologies (from Renewables to e-fuels), through piloting and demonstrating, is crucial for the acceleration of our carbon neutral Energy Transition.

Potential topics include:

- Technologies overviews/panoramas/roadmaps
- Carbon neutral projects (low/medium TRLs)
- Industrial Carbon Neutral projects
- Co-development of technology / technology de-risking (with or without technology developers)
- ...

+ Question and Answer session after each presentation

Session C

Theme: Green Molecules

Technologies overview or specific projects case studies.

Potential topics include:

- Direct Air Capture

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- CCU
 - CCS
 - E-fuels
 - Hydrogen production
 - CO2 logistics
 - Long distance transport of Energy (using molecules such as H2, NH3, Methanol, Methane, ...)
 - Green mobility (electric, green molecules, ...) for personal mobility but also for shipping, aviation, heavy duty,
 - ...

+ Question and Answer session after each presentation

November 23, 2023

Plenary Session – IERE General Meeting

The report of IERE activities by IERE Chair and IERE Central Office

The report of IERE R&D Projects

The report of IERE Technology Foresight 2023

Plenary Session – Technologies of the Future

Emerging trends around carbon capture technologies

Development of innovative and environment-friendly solutions for the treatment and recycling of components in the transition to net-zero

Plenary Session – Special Lecture

Geo-political changes over the last decades resulting in systemic consequences for electricity utilities

SHARE & PULL Workshops

Session D

Theme: Transversal Enablers

On top of the technology itself there is a growing need for transversal enablers.

Potential topics include:

- Critical materials, recycling, etc. in Projects
- Digital and/or Data mining in Projects
- Management of expertise within companies
- Smart-Grid / Energy Management systems in Projects
- Management of expertise in Projects

- REX Methods establishment in Projects
- Risk management & appetite in Projects
- ...

+ Question and Answer session after each presentation

Theme: Circularity & Energy Efficiency

Technologies overview or specific projects case studies.

Potential topics include:

- Circularity of assets (wind/solar/other...)
- Circularity in industrial processes
- Heating & Cooling technologies
- District Heating & Cooling
- Heat pumps
- SWAC
- Retrofit with Led-lighting
- ...

+ Question and Answer session after each presentation

Session E

Theme: Renewable Energy & Electrification

Technologies overview or specific projects case studies.

Potential topics include:

- Green mobility (electric, green molecules, ...) for personal mobility but also for shipping, aviation, heavy duty, ...
- Floating PV
- Floating Wind
- Agri-PV
- Industrial heat
- ...

+ Question and Answer session after each presentation

Theme: Flexibility of the Energy System

Technologies overview or specific projects case studies.

Potential topics include:

- Grid Scale Electricity Storage including and beyond Lithium Ion
- New storage technologies including heat/cold
- EMS
- Green fuel combustion in thermal units

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- Thermal storage
 - Virtual Power Plant
 - Hybridization
 - ...

+ Question and Answer session after each presentation

Closing Remarks

Social Event (Optional)

Visiting Cloud Forest and Flower Dome with dinner at Jumbo Shrimp Restaurant.

November 24, 2023

Technical Tour (Optional)

Visiting [REIDS-SPORE \(ENGIE's Award-Winning Multi-Energy Demonstrator\)](#) or NTU laboratories.

* The choice is weather dependent as REIDS-SPORE is on an island.

Program

Session structure, speakers and timetable may be subject to change according to the registration of speakers and participants.

Welcome Reception

Tuesday, November 21, 2023
PARKROYAL COLLECTION Pickering, Level 5 Terrace

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|-------------|-------------------|
| 18:30–19:00 | Registration |
| 19:00–21:00 | Welcome Reception |

23rd IERE General Meeting and Singapore Forum - Day 1 - Wednesday, November 22, 2023 PARKROYAL COLLECTION Pickering, Conference One

| | |
|-------------|--------------|
| 08:00–08:30 | Registration |
|-------------|--------------|

Plenary Session – WHAT

| | | |
|-------------|------|---|
| 08:30–08:40 | P1-1 | Opening Address MINO Yoshiaki (IERE Chair) |
| 08:40–09:05 | P1-2 | Why are we here? What is the problem we are wanting to tackle? Jan MERTENS (Chief Science Officer, ENGIE Research, France) |

Plenary Session – HOW in APAC

| | | |
|-------------|------|--|
| 09:05–09:35 | P2-1 | Enabling Net-Zero Energy Transition: A Perspective from Singapore's R&D Landscape Muhamad Azfar RAMLI (Deputy Director (Systems Science), Institute of High Performance Computing, A*STAR, Singapore) |
| 09:35–10:15 | P2-2 | Innovations in APAC Caroline GUYOT (Managing Director, ENGIE Factory Asia-Pacific, Singapore) Joel TAY (CEO, PHNXX, Australia) Tommy PHUN |

| | | |
|-------------|------|---|
| | | (Founder, Pyxis, Singapore) Tulika RAJ (CEO and Co-Founder, SunGreenH2) Jan HOLM (Seaborg Technologies) |
| 10:15–10:40 | P2-3 | ENGIE's Ambition in APAC Thomas BAUDLOT (CEO Energy Solutions, Country Head Southeast Asia, ENGIE SOUTH EAST ASIA) |
| 10:40–11:10 | | Coffee Break |

SHARE & PULL Workshops (Session A)

Making Business Out of It

| | | |
|--------------|------|---|
| Chair Person | : | Caroline GUYOT (Managing Director, ENGIE Factory Asia-Pacific, Singapore) |
| 11:10–11:30 | SA-1 | The role of low carbon power generation in support of a just Energy Transition Andrew Minchener, OBE (General Manager, The International Centre for Sustainable Carbon, UK) |
| 11:30–11:50 | SA-2 | EnBW - a utility on the path to sustainability Wolfram Münch (Director Research&Delevopment, EnBW Energie Baden-Württemberg AG Karlsruhe, Germany) |
| 11:50–12:10 | SA-3 | Introduction to the Market-online Hardware-in-the-loop Simulation Experimental Environment Established by Sino-Europe Cooperation YUAN Hao (Senior Engineer, China Electric Power Research Institute, China) |
| 12:10–13:30 | | Lunch |

SHARE & PULL Workshops (Session B)

Regulatory & Public Acceptance

How to Accelerate Learning by Doing?

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|--------------|------|---|
| Chair Person | : | Gregory TOSEN (IERE Advising Chair Emeritus, South Africa) |
| 13:30–13:50 | SB-1 | The Current State of the Balancing Services Market in Japan and Our Pilot Projects to Integrate DSR into the Grid YAMADA Tomoyuki |

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|-------------|------|---|
| | | (Research Scientist, Grid Innovation Research Laboratory, CRIEPI, Japan) |
| 13:50–14:10 | SB-2 | Collaborative Research as an effective tool to speed up industrial transitions: ENGIE Laborelec’s return on experience Jean-Pierre KEUSTERMANS (Research Partnership Manager, ENGIE Laborelec, Belgium) |
| 14:10–14:30 | SB-3 | How to accelerate learning by real scale system testing in harsh environments? The role of climatic validation testing of energy transition technologies operating in demanding worldwide markets Pieter Jan JORDAENS (Program Manager On & Offshore Wind Energy + Manager Energy Transition, Green transition Program, Department Energy Transition, Sirris, Belgium) |
| 14:30–14:50 | SB-4 | REIDS-SPORE: Forging the Path to Sustainable Energy and Innovation Arifeen Md WAHED (Program Manager, ENGIE Lab Singapore, Singapore), Abhiruchi GADGIL (Program Manager, Integration and Energy Management, ENGIE Lab Singapore, Singapore) |
| 14:50–15:10 | SB-5 | PV technology overview, its position in the energy mix and the role of R&D Angelo RODRIGUEZ GARCIA (Project Manager, Renewables and Urban Department, ENGIE Laborelec, Belgium) |
| 15:10–15:40 | | Coffee Break |

SHARE & PULL Workshops (Session C)

Green Molecules

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|--------------|------|--|
| Chair Person | : | Jan MERTENS (Chief Science Officer, ENGIE Research, France) |
| 15:40–16:00 | SC-1 | Challenges of explosion protection in hydrogen electrolysis plants Svenja KOWALZICK (Project Engineer, Process Engineering, RWE TI, Germany) |
| 16:00–16:20 | SC-2 | Online gas analysis in carbon neutral energy production Antti HEIKKILA (Product Manager, Industrial Instruments, Vaisala Oyj, Finland) |
| 16:20–16:40 | SC-3 | Electrolyzer Performance Modeling and Simulation Oscar FRAPPEREAU (R&D Process Engineer at Hydrogen Lab, Vulcain Engineering, consultant at ENGIE Lab CRIGEN, France) |

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|-------------|------|---|
| 16:40–17:00 | SC-4 | Hydrogen Heavy Duty Applications and Testing Ben SKILLINGS (Division Manager, Hydrogen Industry Technology & Testing, Powertech Labs, Canada) |
| 17:00–17:20 | SC-5 | Investigation of green hydrogen production with using geothermal energy and potential hydrogen demand in Kumamoto prefecture KOJO Gen (Hydrogen Business Strategy Division, Kansai EPCO, Japan) |
| 17:20–17:40 | SC-6 | C2FUEL: Demonstrating E-Chemical Production in an Industrial Environment Bérenger WEGMAN (Doctoral Candidate, Lab Hydrogen, ENGIE Lab CRIGEN, France – Sustainable Process Engineering, TU/e, Netherlands) |
| 17:40–18:00 | SC-7 | Impacts of CCS and Electro-hydrogen on Decarbonization Path of Power System QIN Xiaohui (Director of Division of New Type Power System Strategic Planning, Power System Carbon Neutrality Research Center, China Electric Power Research Institute, China) |
| 19:30–23:30 | | Official Dinner |

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| <p style="text-align: center;">23rd IERE General Meeting and Singapore Forum - Day 2 - Thursday, November 23, 2023 PARKROYAL COLLECTION Pickering, Conference One</p> |
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08:00–08:30 Registration

Plenary Session – IERE General Meeting

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|-------------|-------|--|
| 08:30–08:45 | G23-1 | Recent IERE Activities (November 2022–November 2023) MINO Yoshiaki (IERE Chair) |
| 08:45–09:00 | G23-2 | Ongoing Projects and Upcoming Events TAKEI Katsuhito (IERE Secretary General) |
| 09:00–09:15 | G23-3 | R&D Projects – Application of Artificial Intelligence (2nd round) Katharina DILCHERT (International Research Coordinator, E.ON Group Innovation GmbH, Germany) |

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- 09:15–09:30 G23-4 **R&D Projects – Application of Artificial Intelligence (2nd round)**
OIRASE Masaya
(Researcher, Advanced Research & Innovation Center, Chubu EPCO, Japan)
- 09:30–10:00 G23-5 **Technology Foresight 2023 (TF2023)**
Subbu BETTADAPURA
(Senior Director, Growth Advisory, Frost & Sullivan)
- 10:00–10:30 Coffee Break

Plenary Session – Technologies of the Future

- 10:30–10:50 P3-1 **Emerging trends around carbon capture technologies**
Jan MERTENS
(Chief Science Officer, ENGIE Research, France)
Alvin LEE
(Regional Head, APAC, Puro.earth)
Sylvia LOW
(Director Business Development , 1PointFive)
- 10:50–11:10 P3-2 **Development of innovative and environment-friendly solutions for the treatment and recycling of components in the transition to net-zero**
Niels DE BOER
(COO, ERI@N, Nanyang Technological University)

Plenary Session – Special Lecture

- 11:10–11:40 SL-1 **Geo-political changes over the last decades resulting in systemic consequences for electricity utilities**
Gregory TOSEN
(IERE Advising Chair Emeritus, South Africa)
- 11:40–13:00 Lunch

SHARE & PULL Workshops (Session D)

Transversal Enablers

Circularity & Energy Efficiency

- Chair Person : Katharina DILCHERT
(International Research Coordinator, E.ON Group Innovation GmbH, Germany)
Fiona BUCKLEY
(Senior Expert and Senior Project Manager, Renewables and Urban Department, ENGIE Laborelec, Belgium)

| | | |
|-------------|------|---|
| 13:00–13:20 | SD-1 | Modeling and simulation of the valorization of waste heat from hydrogen production in industrial applications Sanae BOUAICHI (R&D Project Manager, ENGIE Lab CRIGEN, France) |
| 13:20–13:40 | SD-2 | Economically Rational CO₂ Reduction Potential in the Japanese Hot Water Sector considering Lock-in Issues: Future Analysis using Micro Data of Survey on Carbon Dioxide Emissions from Residential Sector YAMADA Manaka (Researcher, Socio-Economic Research Center, CRIEPI, Japan) |
| 13:40–14:00 | SD-3 | FUREC: from waste to feedstock Ingo BIRNKRAUT (CEO & Managing Director, RWE Technology International GmbH, Germany) |
| 14:00–14:20 | SD-4 | Development of Energy Management System for Microgrid in Chubu EPCO YAMAGUCHI Ryo (Electric Power Research & Development Center, Chubu EPCO, Japan) |
| 14:20–14:50 | | Coffee Break |

SHARE & PULL Workshops (Session E)

Renewable Energy & Electrification

Flexibility of the Energy System

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|--------------|------|---|
| Chair Person | : | Jean-Pierre KEUSTERMANS (Research Partnership Manager, ENGIE Laborelec, Belgium) |
| 14:50–15:10 | SE-1 | Control, Flexibility and Inertia Technologies for Achieving NDC 2030 and Net Zero 2050 in Korea Jeonghoon SHIN (Director General, Head of Future Grid Research Center, KEPCO Research Institute, South Korea) |
| 15:10–15:30 | SE-2 | TPRI Shulin Microgrid integration and application Heng-An LIN (Electrical Engineer, Measuring Instrument Section, Taiwan Power Research Institute, Taiwan) |
| 15:30–15:50 | SE-3 | Mixing data and knowledge for modeling and control of building energy systems Benoit DELINCHANT (Full Professor at Grenoble INP & Researcher at Grenoble Electrical Engineering Lab, Univ. Grenoble Alpes, CNRS, Grenoble INP, G2Elab, Grenoble, France) |

| | | |
|-------------|------|--|
| 15:50–16:10 | SE-4 | Impact of Household Electrification on the Investment Drivers of PV-Battery Systems Jolien DESPEGHEL (PhD researcher, Department of Electrical Engineering, KU Leuven, Belgium) |
| 16:10–16:30 | SE-5 | Multi-purpose ESS operation technologies for NTAs (Non-Transmission Alternatives) Woongjae JEON (Senior Researcher, Future Grid Research Center, KEPCO Research Institute, South Korea) |
| 16:30–16:50 | SE-6 | Offshore Energy-Islands Fiona BUCKLEY (Senior Expert and Senior Project Manager, Renewables and Urban Department, ENGIE Laborelec, Belgium) |
| 16:50–17:00 | | Closing Remarks |

Social Event (Optional)

Thursday, November 23, 2023

Cloud Forest and Flower Dome with Dinner at Jumbo Shrimp Restaurant

(For participants who have booked the optional Social Event)

At 17:30 Departure at PARKROYAL COLLECTION Pickering

Around 23:00 Break up at the nightlife area along the riverside

Technical Tour (Optional)

Friday, November 24, 2023

REIDS-SPORE (ENGIE's Award-Winning Multi-Energy Demonstrator) or NTU laboratories

(For participants who have booked the optional Technical Tour)

At 08:30 Departure at PARKROYAL COLLECTION Pickering

Around 12:30 Return to PARKROYAL COLLECTION Pickering

*The choice is weather dependent as REIDS-SPORE is on an island.

Conference Venue & Accommodations

Conference Venue

PARKROYAL COLLECTION Pickering, Singapore

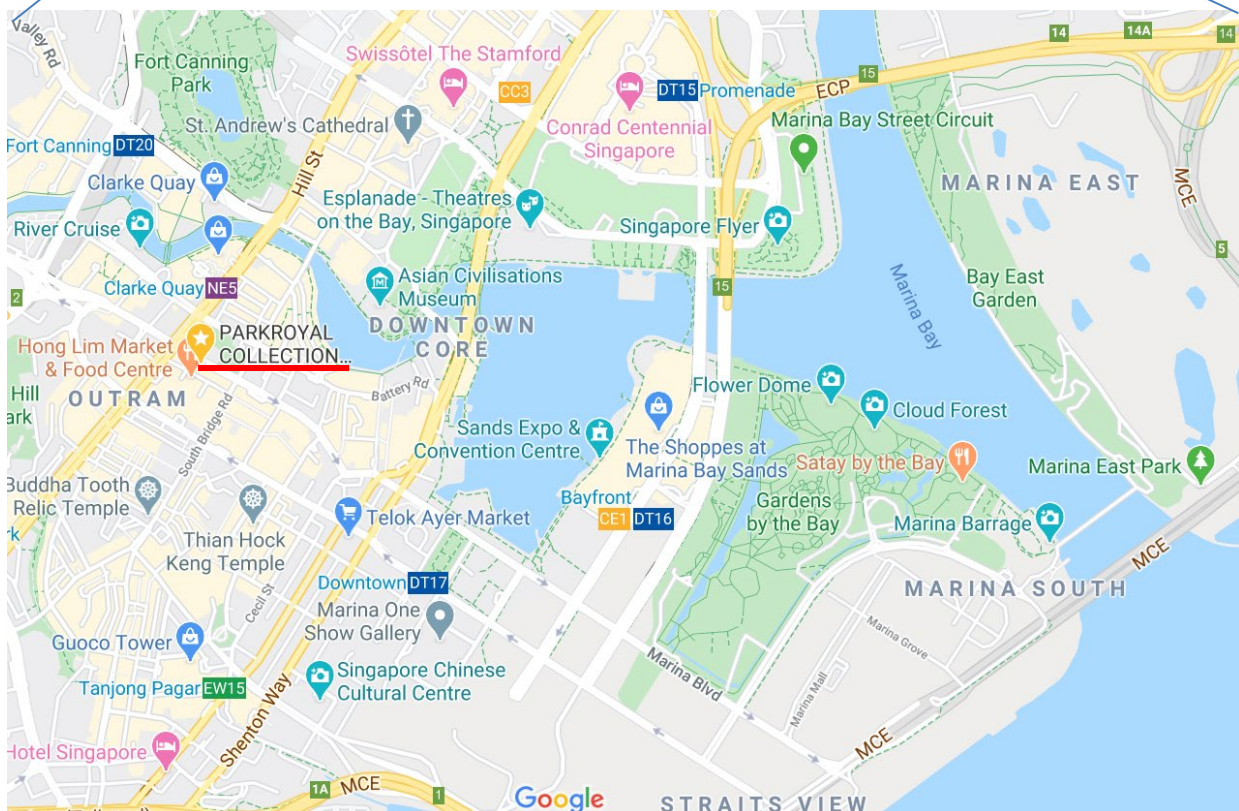
Location: 3 Upper Pickering St, Singapore 058289

Website: <https://www.panpacific.com/en/hotels-and-resorts/pr-pickering.html>



Location of the PARKROYAL COLLECTION Pickering

<https://goo.gl/maps/1WjAFBduAJghqPpb6>



Accommodations

PARKROYAL COLLECTION Pickering, Singapore

Location: 3 Upper Pickering St, Singapore 058289

Website: <https://www.panpacific.com/en/hotels-and-resorts/pr-pickering.html>

Discounted group rates are available.

This offer is on a first-come-first-served basis.

There is only a limited of rooms.

Please send Room Reservation Form directly to PARKROYAL COLLECTION Pickering through the below website.

URL: <https://book.passkey.com/e/50578049> (Closed)

- ENGIE / IERE don't take any responsibility in room reservation of each participant.
- No room block is set at the hotel. Early reservation is recommended.
- For further details as to Guarantee & Cancellation Policy etc., please confirm the Hotel.



IERE Members List (as of November 1, 2023)

| | | | |
|---------------|------------------|-------------------|---------------------|
| Australia | CSIRO | | |
| Canada | Hydro-Québec | Powertech Labs | |
| China | CEPRI | GPG | NARI |
| Czech | CEZ | | |
| Finland | Vaisala | | |
| France | Enedis | ENGIE | |
| Germany | E.ON | EnBW | RWE TI |
| Hong Kong SAR | CLP | | |
| Indonesia | PLN | | |
| Iran | NRI | | |
| Israel | IEC | | |
| Japan | Chubu EPCO | Chugoku EPCO | CRIEPI |
| | FEPC | Fuji Electric | Hitachi |
| | Hokkaido EPCO | Hokuriku EPCO | IHI |
| | J-POWER | JAPC | Kansai EPCO |
| | Kyushu EPCO | MHI | Mitsubishi Electric |
| | NGK | Sumitomo Electric | Shikoku EPCO |
| | Tohoku EPCO | TEPCO | TOSHIBA |
| Malaysia | TNB | | |
| Mexico | INEEL | Prolec GE | |
| Netherlands | TenneT | | |
| Norway | SINTEF | | |
| Pakistan | Karachi Electric | | |
| Philippines | APC | MERALCO | |
| Singapore | SPPA | | |
| South Africa | Eskom | PIESA | |
| South Korea | Hyundai Electric | KEPCO | KERI |
| | KOEN | KOMIPO | KOWEPO |
| | LS Electric | | |
| Spain | NATURGY | | |
| Taiwan | TPC | | |
| US | EPRI | SwRI | |



About ENGIE

Our group is a global reference in low-carbon energy and services. In response to the urgency of climate change, our ambition is to become the world leader in the zero carbon transition "as a service" for our customers, in particular global companies and local authorities. We rely on our key activities (renewable energy, gas, services) to offer competitive turnkey solutions.

With our 170,000 employees, our customers, partners and stakeholders, we are a community of Imaginative Builders, committed every day to more harmonious progress.

Turnover in 2019: 60.1 billion Euros. The Group is listed on the Paris and Brussels stock exchanges (ENGI) and is represented in the main financial indices (CAC 40, DJ Euro Stoxx 50, Euronext 100, FTSE Eurotop 100, MSCI Europe) and non-financial indices (DJSI World, DJSI Europe and Euronext Vigeo Eiris - World 120, Eurozone 120, Europe 120, France 20, CAC 40 Governance).

Please visit: www.engie.com

About IERE

IERE is an organization for exchanging electricity and energy related cutting-edge technologies and R&D information among its members from the electricity and energy supply industry, equipment provider businesses, academic research, government, etc. This unique platform is of great help for executives, senior managers, engineers, and researchers who are responsible for R&D and solutions. It is a worldwide, non-profit organization, established as "International Electric Research Exchange" in 1968.

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