港燈
HK Electric

Innovating Beyond Boundaries

Innovation Report 2023

We Power Innovation for Success

As one of the world's longest-established power companies, HK Electric has always prided itself on its world-class reliability of supply and excellent customer service. In today's rapidly changing business landscape, we recognise that continuously driving innovation at all levels is key to our future success. Innovation is also a force generating sustainable solutions that will make a real difference to our world.

Our vision is to adapt and transform the knowledge, competencies, skills, and creativity of our people and other external parties to develop innovative approaches, solutions, and tools that add value. These efforts will help us maintain our status as a world-class power utility.

Innovating Beyond Boundaries

The process of innovation, from ideation to realisation, is a challenging one. At HK Electric, we believe that innovation arises from people's willingness to collaborate and seek inspiration in unfamiliar and unexpected places. By approaching problems from different perspectives, seeking out diverse viewpoints, and collaborating with individuals from different backgrounds and disciplines, barriers are overcome, and new frontiers explored. These approaches often lead to novel solutions for complex problems.

For example, by collaborating with various reputable institutions in Hong Kong, we are able to leverage their expertise in exploring Artificial Intelligence (AI) methods for determining cable health. We have also partnered with non-governmental organisations (NGOs) to deploy self-developed cross-platform apps, created using a no-code development platform for administering community programmes to support disadvantaged groups. These apps help promote a low-carbon lifestyle and convey our care for the community.

Our Innovation Portfolio

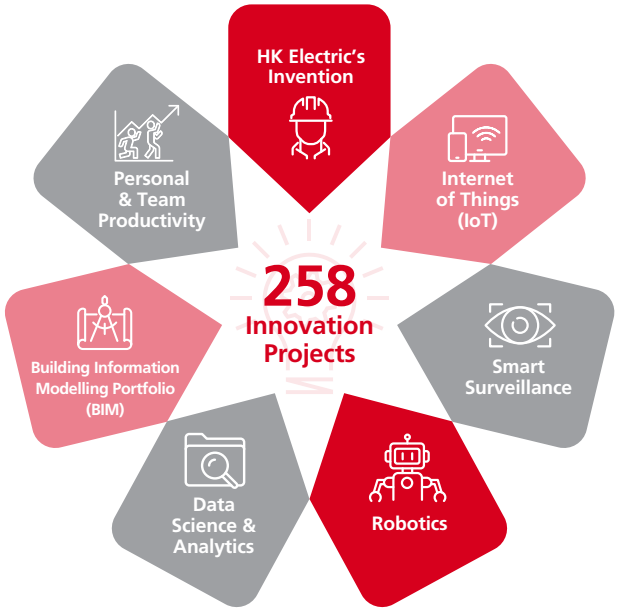
Our current innovation portfolio comprises a wide range of improvements, spanning from incremental innovations such as mobile applications that digitalise and streamline our business processes to breakthrough innovations like our patented technologies for remotely monitoring circuit breaker operations and identifying potential failure conditions.

We have embraced various innovation-enabling technologies to drive efficiency and streamline operations. Robotic Process Automation (RPA) has been introduced to automate repetitive tasks and optimise business processes. Tableau, a powerful data visualisation and business intelligence tool, empowers us to analyse and present data in a visually compelling and interactive manner.

Furthermore, we have adopted a no-code development platform, named as eConnect, that enables our employees with no or little training on software development to build customised mobile apps without the need for coding. This adoption has resulted in the successful deployment of over 120 eConnect apps, enhancing our day-to-day operations and productivity.

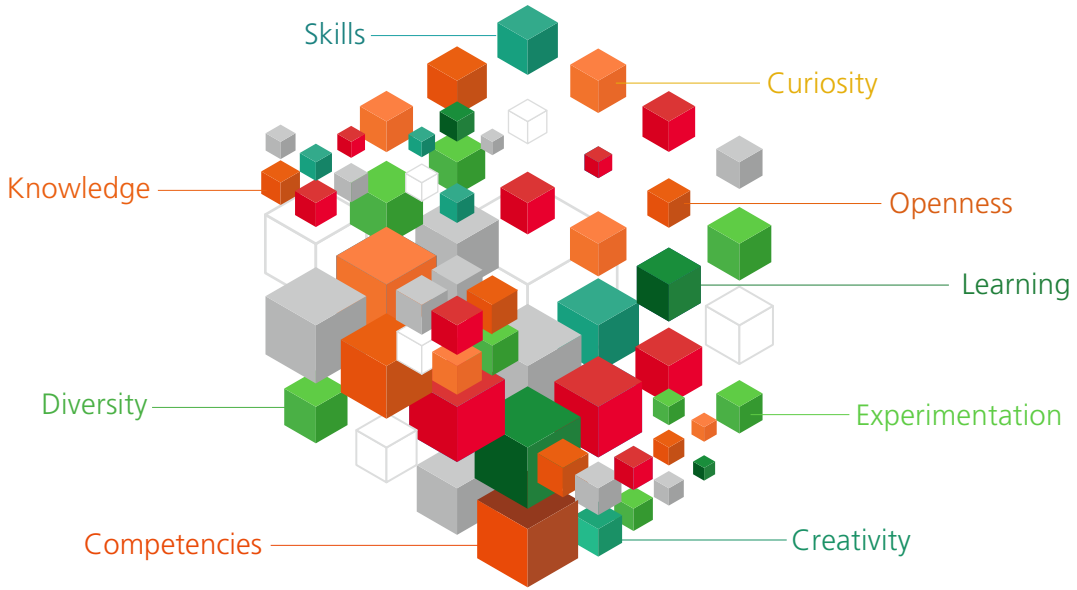
These initiatives add value to our company and ensure our ability to maintain a world-class reliability of supply.

Some of our most notable innovation efforts are described in detail in the following chapters, and more are listed in the appendix.



Our Innovation Journey

In 2018, we formalised our innovation journey by establishing a dedicated committee. Chaired by the Managing Director, the Innovation Steering Committee operates under a two-tier governance structure – it directly oversees our large-scale transformational projects while individual business units manage their own smaller-scale innovation initiatives.



HK Electric is committed to embracing the shared values, beliefs, and behaviours that foster a culture of innovation. We encourage openness, curiosity, continuous learning, experimentation, creativity, and challenging implicit assumptions and the status quo. We also support measured risk-taking, the tolerance of failures, and the process of learning from mistakes.

We welcome diverse perspectives, listen to feedback, suggestions, and reflections, and support the development of "T-shaped" skills among our staff. Furthermore, we promote interdisciplinary collaboration both within and outside HK Electric.

Inside the InnoGEN Room, our innovation corner at Lamma Power Station

To enhance employee morale, motivation, and engagement, as well as to acknowledge their contributions to innovation, we initiated our inaugural innovation competition in 2019 with a focus on safety improvement. A total of 21 entries were submitted, among which one silver award and four merit awards were presented to commend notable achievements.

In 2021, we went on to organise a comprehensive innovation award encompassing four distinct categories: large-scale projects, medium/small-scale projects, innovative application of market-available technologies, and process re-engineering and/or digital transformation. With an impressive participation of 38 entries, the Gold, Silver, Bronze, and Merit awards were selected in June 2022.

HK Electric also provides a combination of physical and digital infrastructure to support its innovation journey. This includes dedicated innovation spaces, advanced innovation tools and methods, and Inno Hub, an online community platform where ideas can be shared and collaboration undertaken within and across business units.

Inno Hub
aims to provide an online community that brings together different perspectives and a diversity of experience with an objective of nurturing a strong and robust innovation culture.

Inno Sight
serves as a platform that combines insights and knowledge to foster more innovative thinking and idea, while also facilitating cross-business-unit collaboration and showcasing a collection of ideas.

Inno Project
is a portfolio that showcases ongoing innovation initiatives, providing visibility into the process of turning ideas into tangible outcomes.

Inno Post
is a platform for sharing of a wide range of innovation-related publications and showcasing highlights from various innovation events.

Inno Trial
features post-trial briefs with the aim of providing valuable lessons learnt from ideas that have been tested and did not proceed to implementation.

Inno Success
features post-project briefs with the aim of providing valuable insights into the learning gained from innovation projects and facilitating emulation across business units.

Inno Watch
is a platform designed for monitoring and tracking technology-based innovations and trends, both within and outside the utility industry.

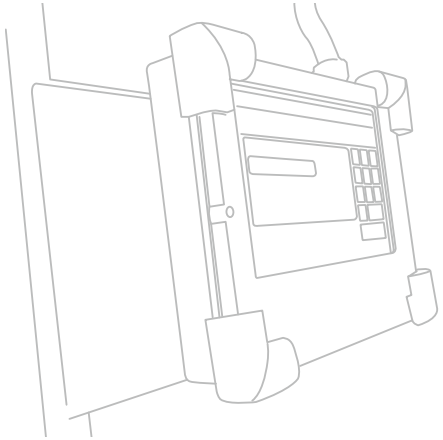
We Transform for Better Performance

> For HK Electric, transformation means enhancing our organisational performance to achieve long-term success. It involves making significant changes to processes, drawing up strategies to improve our performance and adapting to changing market conditions, customer and business needs.

A key aspect of transformation is the adoption of new technologies. These technologies enable us to enhance operational efficiency, reduce costs, and improve the work experiences and satisfaction levels of our staff. In addition, we regularly revamp our business processes to streamline workflows, eliminate redundancies, and automate manual tasks. Two projects that exemplify successful transformation are our "Smart Cabinet and RFID Buffer Store" and our "Artificial Intelligent (AI) Video Surveillance for Substation Monitoring".

Smart Cabinet and RFID Buffer Store 08
Artificial Intelligent (AI) Video Surveillance for Substation Monitoring 09

Smart Cabinet and RFID Buffer Store

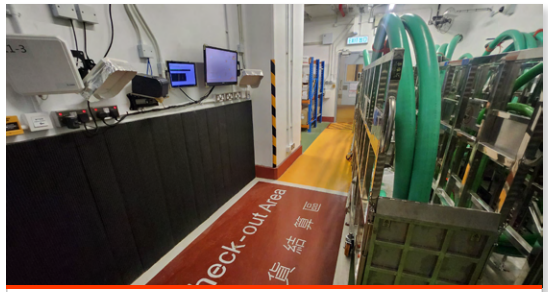


The implementation of mobile smart cabinets at Electric Tower has redefined our goods-issuing process. Previously, engineers faced delays as they had to wait for cargo lifts to access equipment on the 6th floor. Now, they can conveniently retrieve materials directly from smart cabinets located on the 2nd floor. These cabinets are pre-stocked with requested items, eliminating waiting time and reducing congestion, particularly during peak hours.

The smart cabinets have also transformed the goods-issuing process into an "anytime, anywhere" system, significantly enhancing operational efficiency. Engineers can request goods at any time, and storekeepers will arrange for the requested items to be placed in the cabinets, accessible to engineers at their convenience. Furthermore, the mobility of these cabinets adds flexibility and convenience.

With the rising trend of automation, unmanned stores are gaining popularity. HK Electric has already set up an unmanned warehouse some years ago, utilising RFID technology for self-service retrieval of spare parts. In 2022, we expanded the RFID warehouse to accommodate a wider range of critical spare parts.

Streamlining goods issuing: a fast and simple approach

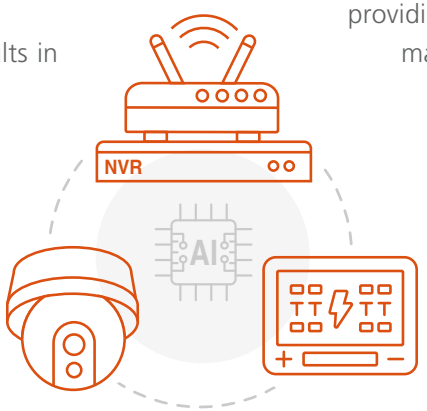


The RFID buffer store provides an unmanned and efficient goods collection service for emergency repairs

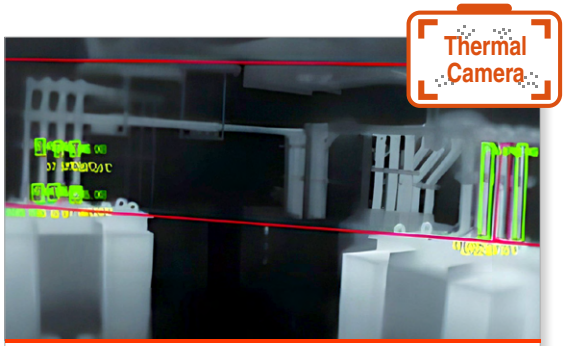
Artificial Intelligent (AI) Video Surveillance for Substation Monitoring

The health of the equipment in our network of over 4,000 distribution substations is critical to ensuring a reliable electricity supply for our customers. Studies of equipment failure in distribution substations show that the most common causes are overheating, water ingress, and intrusion of rodents and other small animals. "Hot spots" can develop on components of substation equipment such as low voltage fuse panels and transformer busbars as faults start to develop.

Detecting these potential faults in a timely manner can prevent unplanned equipment outage and interruption of supplies to customers. However, the current process relies heavily on manual inspections during routine substation maintenance.



One innovative idea is the use of thermal cameras to continuously monitor the substations and detect hot spots. Moreover, we have incorporated an AI analytic function into the video surveillance system for a distribution substation as a pilot project. This integration enables immediate triggering of alarms if abnormal temperature changes are detected in the substation, alerting the maintenance team or the System Control engineer on duty. The implementation of this surveillance system holds great potential for providing us with an effective asset management solution while reducing our manpower needs for on-site inspections.



Thermal camera footage detecting abnormal temperature

Equipment to be monitored by the system

We Collaborate for Greater Synergy

> Collaboration allows different stakeholders to bring a wide range of unique perspectives, skills, and expertise to the table to address complex challenges, often leading to innovative and comprehensive solutions. It also fosters better communication and understanding between different parties, building trust and enhancing working relationships to create win-win situations.

Recognising this, HK Electric has established partnerships with different parties to develop innovative solutions, including "Digital Collaboration with NGOs" and "11-kV Cable Condition Assessment using Big Data Analytics". Both of these demonstrate how collaboration enhances synergy and addresses sustainability challenges effectively. Through these, HK Electric is able to leverage the expertise of its partners to develop solutions that benefit the community and contribute to Hong Kong's transition towards a smart and sustainable city.

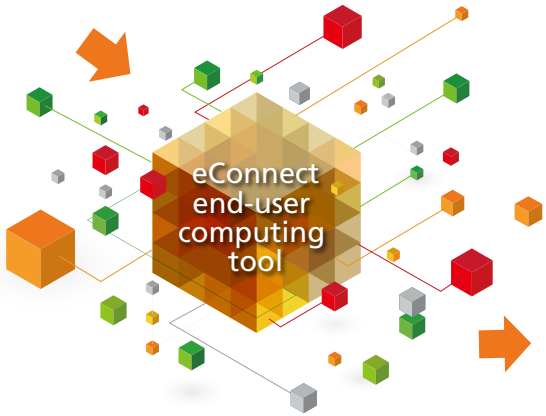
Digital Collaboration with NGOs 11
11-kV Cable Condition Assessment using Big Data Analytics 13

Digital Collaboration with NGOs

HK Electric launched the Smart Power Care Fund (SPCF) in October 2018 to provide subsidies for the disadvantaged through various programmes. The SPCF is implemented in collaboration with more than 65 NGOs, promoting the adoption of a low-carbon lifestyle while showing care to the community.

To maintain efficient and effective communications with NGO partners and to achieve a seamless workflow, HK Electric has developed various in-house mobile-desktop cross-platform apps using the "eConnect end-user computing tool" for SPCF programmes. These programmes include the NGO Catering Subsidy, the SDU Electricity Charges Relief, the Energy-efficient Appliances Subsidy, and the "Care and Share" SME Caterers Subsidy.

The apps were utilised by both HK Electric and its NGO partners to manage over 3,000 applications and activities for the disadvantaged each year. The eConnect app for the NGO Catering Subsidy streamlined internal processes and enhanced the overall stakeholder experience. One of the apps is for Energy-efficient Appliances Subsidy which enabled HK Electric and its NGO partners to expedite the application process.



The eConnect app for the NGO Catering Subsidy streamlined internal processes and improved the overall stakeholder experience

The eConnect app for the Energy-efficient Appliances Subsidy enabled HK Electric and its NGO partners to process applications speedily

SDU: Sub-divided units

Another eConnect app was developed for handling the registration and distribution of 40,000 sets of "Care and Share" 2020 dining coupons for disadvantaged families. All the collected data were securely transmitted and stored in back-end databases for monitoring, visualisation, reporting, analytics, and planning.

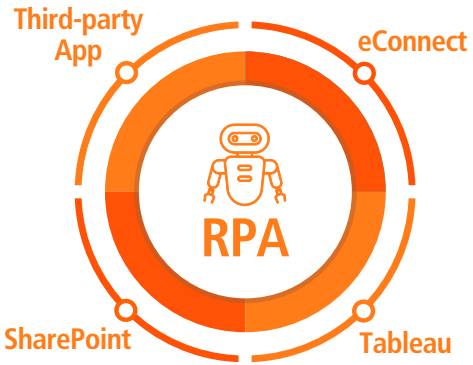
The digitalisation initiatives have helped the NGOs change their practices, encourage them to transition from paper-based operations to more efficient and accurate digitalised operations. NGO feedback has also enabled us to further enhance our eConnect apps, for example by adding better user interfaces and functionalities.

The RPA integrated digital solution for "Care and Share" SME Caterers Subsidy Scheme received recognitions for its outstanding innovation initiative, including the "Best in Future of Industry Ecosystems" of 2021 IDC Future Enterprise Awards for Hong Kong and the "Smart Business (Solution for SME): Silver Award" of Hong Kong ICT Awards 2021.

Since the launching of these digital solutions, we will have saved by end 2023 over 250,000 pieces of A4 papers, about 250,000 manhours for HK Electric and collaborating partners, and about 7,000 kg of carbon emission. This digital collaboration journey has achieved buy-in from our NGO partners and given them the confidence to scale up their own digitalisation initiatives. The benefits have also extended to the SPCF programme beneficiaries, and more generally contributed to Hong Kong's transition towards a smart, zero-carbon, and caring city.

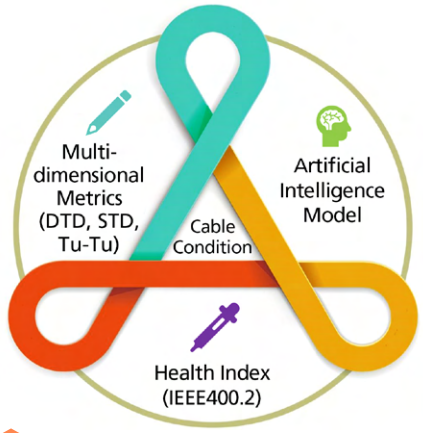
Coupon redemption for the "Care and Share" SME Caterers Subsidy Scheme is speedy, digitalised, and fully-tracked

The entire "Care and Share" SME Caterers Subsidy Scheme can be monitored real-time at HK Electric's office



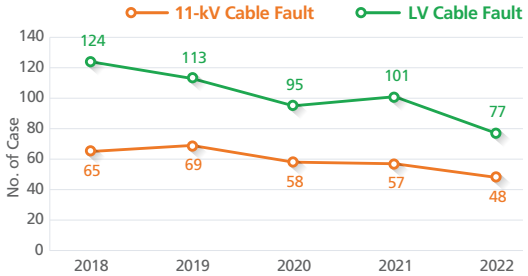
We designed and implemented an RPA-integrated digital solution for real-time visualisation, analysis and integrity checking of the entire coupon journey

11-kV Cable Condition Assessment using Big Data Analytics



Multiple Cable Condition Assessment Methods for 11-kV Power Cables

Electric cables are crucial components for power delivery. About ten years ago, we developed a system called the Health Index (HI) that enables us to assess the condition of 11-kV distribution cables according to the IEEE 400.2 industry standards. We have since continued to look for ways to further increase the accuracy of such assessment, and to this end, we have developed two innovative methodologies. The first involved designing a Cable Condition Evaluation Index to supplement the existing Health Index by



The trend of 11 -kV and LV Cable faults in the past 5 years.

using data from different electrical behaviours of the cable, (i.e., Delta Tangent Delta (DTD), Standard Deviation of TD (STD), and Tip-up of tip-up of TD (Tu-Tu), collected under various testing conditions in the Very-low Frequency (VLF) test. This method has optimised our cable maintenance actions. A technical paper on this approach, published in HKIE Transactions (Volume 29, Issue 1, 2022), won the HKIE Best Transactions Paper Prize 2022.

The second one is a collaboration with the Centre for Advances in Reliability and Safety (CAiRS) at the Hong Kong Polytechnic University to explore the possibility of identifying cable health conditions using AI. The AI models developed by CAiRS are able to evaluate the probability of a cable circuit failure and predict the at-risk component if the cable circuit is found to have a high failure probability. This is the first-ever AI software developed for cable health analysis. These two innovations have significantly improved the accuracy of our cable diagnosis and helped enhance our cable maintenance strategy. Even though our cables are continuously aging, the number of cable faults have been in a downward trend in the past 5 years with the application of these condition monitoring techniques.

CAiRS Experts and HK Electric Engineers Inspect High-voltage Power Cable Defects

We Invent for a Better Community

> Innovation drives individuals and organisations to create new solutions to existing problems or challenges. By encouraging people to push boundaries and think outside the box, innovation has the potential to bring significant improvements to our daily lives.

In this spirit, HK Electric has made significant efforts to create innovative solutions that will benefit the community. Two examples of these efforts are our "Modified Fuse Holder for Traffic Light Controllers" and our "Smart CB Monitoring and Analytics System", both demonstrating creative thinking for new solutions that address existing problems and make Hong Kong a better place to live.

Modified Fuse Holders for Traffic Light Controllers

The supply of electricity to Traffic Light Controllers (TLCs) will inevitably be disrupted during maintenance of equipment and reinforcement of the electricity supply. However, with the introduction of uninterrupted power source transfer using Static Transfer Switch and Modified Fuse Holder (MFH) in 2014, it is no longer necessary to interrupt service to TLCs during planned work.

The exception to this is when the MFH is first installed in the service cutout inside the TLC cubicle. During this installation, the supply fuse has to be removed to connect the wires to the MFH, which affects the power supply and, consequently, the operation of the TLC. Using the concept of no-break backfeed in our low-voltage network, the HK Electric team developed a prototype of a bypassing device that provides an alternative current path for the retrofit. This means that supply to the TLC can be maintained during the retrofitting of the MFH, allowing normal operations to continue and ensuring safety for road users.

The innovative MFH retrofitting procedures use self-designed parts and readily available low-cost electrical components, including fuse holders and connectors. Demonstrations have been made to the Electrical and Mechanical Services Department (EMSD) and the Transport Department of the Hong Kong Special Administrative Region (HKSAR) Government as well as CLP Power, which faces the same site difficulties relating to the suspension of electricity supply to TLCs.

In June 2022, we developed an enhanced design of the retrofit kit. The enhanced version can be applied to a TLC with around 50% of the original working space, further cutting the retrofit time from about 30 minutes to about 5 minutes.

This innovation has saved HK Electric and the government departments 1.5 mandays and 2.5 mandays respectively for handling the outage of a TLC and the associated traffic lights.

Retrofitting a Modified Fuse Holder inside a road-side cubicle for a Traffic Light Controller

Smart Circuit Breaker (CB) Monitoring and Analytic System

Our uniquely-developed remote circuit breaker monitoring system analyses the waveform of the trip coil current of the circuit breaker in order to evaluate the health of medium voltage circuit breakers at our zone substations.

The system, which was granted a Hong Kong short-term patent in July 2022, assesses the health of the circuit-breaker mechanism by analysing the waveform of the trip coil current profile. A distorted current waveform usually indicates a sticky mechanism with dried-out lubricant, which is an early symptom of circuit breaker failure.

A statistical model was developed to identify and classify abnormalities in the trip coil current profile numerically. Each online waveform captured by the system is analysed and assigned a health index. Any outlier switchgear can be identified and preventive maintenance carried out at an early stage to minimise the risk of circuit breaker failure. This health index has enabled us to move further from a time-based to condition-based maintenance for the switchgear and reduce maintenance cost.

The system uses only one digital oscilloscope to monitor about 40 different circuit breakers.

The monitoring system is installed above the switchgear panel


Patents Registry
Intellectual Property Department
The Government of the Hong Kong Special Administrative Region
批予短期專利證明書
《專利條例》(第 514 章)
CERTIFICATE OF GRANT OF SHORT-TERM PATENT
Patents Ordinance (Chapter 514)
I hereby certify that a short-term patent with the following particulars has been granted today:
專利編號 Patent No.: HK30064886
申請編號 Application No.: 32021040574.4
專利所有人姓名或名稱及地址 Name and Address of Proprietor:
The Hongkong Electric Company Limited
Hongkong Electric Centre
44 Kennedy Road
HONG KONG
發明名稱 Title of Invention:
用於監控電力電路中的斷路器的系統和方法
SYSTEM AND METHOD FOR MONITORING CIRCUIT BREAKER IN POWER CIRCUIT
短期專利有效期 (在符合續期的規定下) Term of Short-term Patent (subject to renewal):
由 18.10.2021 起計 8 年
Eight years commencing on 18.10.2021

Hong Kong Short-Term Patent (No. HK30064886)

Installation is very simple, as only the DC trip wire of the circuit breakers needs to be monitored. This innovative but simple system has enabled us to monitor a large number of medium voltage circuit breakers in our zone substations efficiently and economically.

We Innovate for a Sustainable Planet

> Enhancing sustainability and reducing carbon emissions are imperatives for today's world, and innovation has a crucial role to play in achieving these outcomes.

Two projects by HK Electric demonstrate our commitment to creating a more environmentally friendly and sustainable world. They are the "Fish Deterrent System" and the "Smart Power for Construction Site", both of which exemplify the significance of innovation in achieving sustainability and creating a better future for future generations.

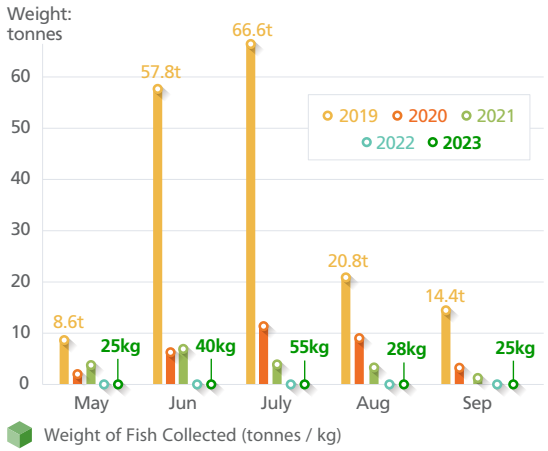
Fish Deterrent System

In 2019, we implemented a self-developed acoustic fish deterrent system for Lamma Power Station. Every year, over 1,500 million cubic meters of sea water are extracted to cool the electricity generation units there. If rubbish or marine life enter the Circulating Water (CW) systems, as they often do, they can create blockages that restrict condenser operation and disrupt power generation.

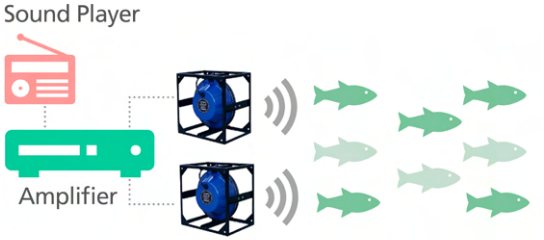
Ready-made acoustic fish deterrent systems from overseas were considered too expensive, so the power station decided to build its own system as a pilot project. The system consisted of a sound player, an amplifier, and several underwater speakers. After testing different sound frequencies and decibel levels, whale sounds (which contain low frequency sounds ranging from 50-200 Hz) were chosen as the most effective deterrent for the fish species commonly found in the vicinity of the power station.

The system installed at CW intake No. 4 was identified as the best site for the pilot project, and the volume of marine life collected from the CW system was closely monitored to evaluate its effectiveness. A significant reduction in the amount of small fish entering the CW intake from 9-67 tonnes per month in 2019 to 2-11 tonnes per month in 2020 in the summer season was recorded.

Following this encouraging result, the power station installed acoustic fish deterrent systems at the CW intakes of all its generation units. The combined operation led to further reduction in the weight of fish collected, to a mere 25-55 kg per month in 2023.



Weight of Fish Collected (tonnes / kg)



Schematic diagram of the Fish Deterrent System

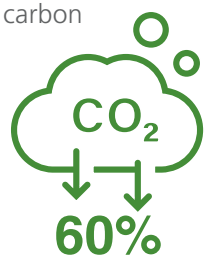
Fish Deterrent System - underwater speaker

Fish Deterrent System - amplifier and sound player

Smart Power for Construction Site

More than 60% of carbon emissions in Hong Kong are attributable to buildings, and 15 to 20% of the carbon footprint in a building's lifecycle comes from its construction process and construction materials.

Conventionally, diesel generators are used to provide electricity at construction sites. These generators need to be kept on standby at all times, an arrangement that not only wastes diesel fuel and increases operating costs, but also results in air and noise pollution which can affect the health of construction site personnel and residents in the vicinity. Replacing diesel generators with electricity from the grid can eliminate harmful air and noise pollution and reduce the carbon emissions by at least 60%. Grid-electricity is reliable, stable and economical.



Our professional team provides a single-point contact and hassle-free electricity supply service to meet customers' needs in different construction phases

We work with customers at the project planning stage to formulate grid-electricity supply solutions in advance

In April 2021, HK Electric re-engineered its grid-electricity supply practice to enable early and full electrification of construction sites under the Smart Power for Construction Site (SPCS) service. To date, we have assisted 23 construction sites to obtain sufficient grid-electricity supply at the early stages of construction, thereby eliminating or substantially reducing the use of diesel generators, and at the same time avoided about 9,000 tonnes of CO_2 emissions. This was achieved through early engagement with construction sector stakeholders to introduce to them the benefits of early and full construction electrification, along with the provision of agile packaged electricity supply solutions, and seamless collaboration with project owners before construction works began. To help the construction ecosystem move towards carbon neutrality, we are continuing to engage and share success stories and insights with industry practitioners, while further enhancing our decarbonisation services.

Agile grid-electricity supply solutions via pre-fabricated transformer pillars and low-voltage cables

We Craft and Create for a Smarter Future

> As a utility company in a regulated market, HK Electric faces two major innovation challenges. One is the upgrade or replacement of legacy infrastructure; the other is sourcing talent with the necessary skills to support innovation.

Despite these challenges, the outlook for innovation in the utility industry is positive. Digital technologies, smart grids, Internet-of-Things (IoT) devices, and AI are all transforming the industry. Utilities that embrace these innovations are likely to gain a competitive advantage, as they help improve efficiency, reduce costs, and enhance customer services. However, embracing innovation must be tempered by careful planning, collaboration, and a focus on customer needs to ensure long-term success.

With regard to the challenge of legacy infrastructure, this is being addressed with the use of new technologies. For example, emerging Internet-of-Things (IoT), advanced monitoring devices and new communication technologies are generating innovative solutions that are helping utilities like HK Electric optimise their operations, improve efficiency, reduce maintenance efforts and lower costs.

Under our AI initiative, HK Electric prioritise collaboration with business units to identify opportunities for integrating AI into our operations. We establish a robust data governance framework to ensure the accuracy and accessibility of data. Continuous training and development opportunities are provided to our team members, and investments are made in software, hardware and human resources to address cybersecurity challenges. Ethical and regulatory compliance remains a key focus,

and our AI strategies are regularly updated to align with industry's best practices. Looking ahead, we envision leveraging AI in areas such as predictive maintenance, load forecasting, and customer services to enhance decision-making and customer experiences. Automation of repetitive tasks will free up valuable time for employees to focus on strategic activities, and ongoing AI projects like contingency analysis for distribution network and smart surveyance with automatic guided vehicles aim to improve operational efficiency and safety.

In the realm of IoT, HK Electric take a proactive approach to managing security challenges and implementing privacy measures to safeguard data. We prioritise the reliability and maintenance of IoT devices and strive for seamless integration with existing systems. Standardisation of IoT communication protocols and standards is emphasised to promote interoperability and overcome the challenges posed by diverse standards in IoT and edge computing.

Additionally, achieving scalability in our IoT and edge computing solutions is a priority to ensure efficient management of growth and performance, aligning with evolving business needs. Looking ahead, we see significant opportunities in leveraging IoT for real-time monitoring of assets, equipment, and infrastructure. Ongoing IoT projects like remote settlement monitoring on infrastructures and remote fault sensors aim to proactively identify maintenance needs, prevent breakdowns, and optimise asset performance, resulting in reduced downtime and cost savings.

As for the challenge of sourcing talent with the skills to support innovation, this includes skills in data analytics, cyber security, and emerging technologies such as AI and blockchain, skills which are not traditionally associated with utility companies. To address this, HK Electric emphasises the importance of innovation in its personnel development. This means encouraging diverse perspectives, welcoming feedback and suggestions,

providing relevant training, and supporting the development of "T-shaped" skills among its personnel. We also encourage increased interdisciplinary collaboration, both within and outside the organisation which is conducive to fostering an innovation culture within the company as we strive to create a smarter future.

In conclusion, while innovation presents its share of challenges, our commitment to collaboration and exploration of new avenues will pave the way for a better future. By embracing emerging technologies, collaborating with stakeholders, and finding inspiration from unfamiliar and unexpected sources, we can collectively drive meaningful innovation and create a brighter future.

16 Large Scale Innovation Projects

Smart Low Voltage Fault Indicator with Enhanced Features
An innovative fault detection device that can significantly reduce the time needed to restore electricity supply.

Electronic Permit-To-Work System
A process digitalisation that improves work efficiency, eliminates potential human errors, and ensures data integrity and confidentiality.

Smart Construction – Powering for Sustainability
A collection of smart devices that work together to improve work efficiency and enhance safety of construction projects.

40 Medium/Small Scale Innovation Projects/Tasks

Non-contact Voltage Detector – Monitoring Fuse Condition on LV Panels
An innovative use of non-contact voltage detectors to enable fast detection of low voltage faults while maintaining ease of deployment.

Sound-based Fault Detector for 22-kV Switchgear in Distribution Substations
A self-developed sound-based fault detector.

RPA Filing and Administration of Hashtagged Emails for all Smart Power Services
Robotics process automation for the efficient management of customer correspondence.

Application of Powered Tools in Preparation for Cable Jointing
A self-invented tool with specialised cutters enabling the safe removal of cable sheaths, armour and insulation without damaging the conductor.

Portable Fault Detector to catch Intermittent Earth Fault of 11-kV Cable
A self-developed intermittent earth fault detector with high sensitivity that can proactively avoid forced outages by detecting cable deterioration.

Operation Time Measurement Tool for 11-kV Switchgear in Distribution Substation
A self-developed switchgear health checking device that facilitates condition-based maintenance of 11-kV switchgear in distribution substations.

90 Projects/Tasks of Innovative Application of Market-available Technologies

AI-based Assessment of a Chiller Plant Energy Saving Initiative
Energy savings achieved through AI model simulation of the effects of adjusting the chiller water supply temperature.

UAV Application in Coal Yard Survey
Aerial scanning of a large area of the coal yard profile to reduce overall working time and cost for coal yard surveys and improve the accuracy of survey results with unmanned aerial vehicles (UAVs).

Remote Assistance with Smart Glasses
Smart glasses to help frontline staff receive clear instructions from experienced staff not at site when carrying out daily work and urgent O&M tasks. They include AR and On-Screen Editing features for making precise annotations on real-world features.

Wifi Bridge for Long Range Signal Transmission
Implementation of a long-range Wifi bridge between two network devices to prevent cable damage during rotational and translational movements.

Robotic Application in Routine Power Plant Inspection
Use of robots for routine power plant inspections to reduce manpower and improve safety.

3D Printing of Obsolete OEM Spare Part
Partnership with a local 3D printing services company for the rapid production of obsolete OEM spare parts.

112 Projects/Tasks of Process Re-engineering and/or Digital Transformation

eConnect Platform – over 60 Mobile Apps Developed by End Users
A no code platform for building customised business apps, enabling users to create and deploy applications without extensive coding knowledge.

Data Visualisation Platform – over 40 Dashboards Developed by End Users
A user-friendly data visualisation tool that is delivering data analysis and visualisation capabilities to our business units.

RPA Platform – 4 Business Processes Automated
Software robots that are automating repetitive tasks, improving efficiency, and reducing human input into business processes.

港燈
HK Electric

The Hongkong Electric Co., Ltd.
44 Kennedy Road, Hong Kong
www.hkelectric.com