





# POWER TO THE PEOPLE

*For more than a century, Hongkong Electric has provided the vital energy that has powered Hong Kong's development.*

*By Arun Sudbaman*

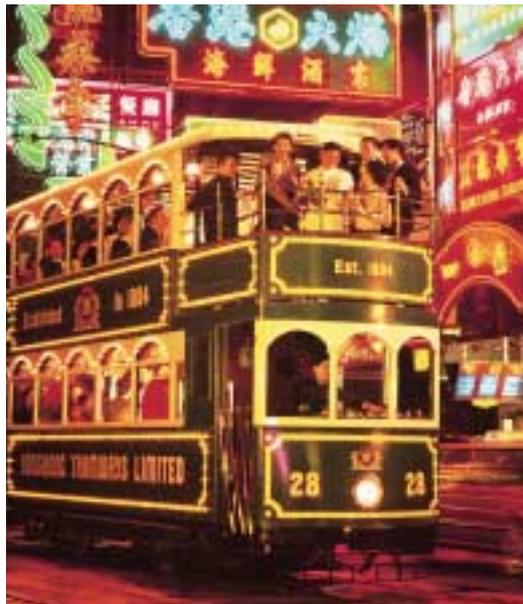


Imagine Hong Kong waking up without power. Apartment lights don't work; neither do electric kettles, cookers or water geysers. Stumbling out into the morning, unwashed and hungry, the workforce is immobilised. Neither the trams nor the Mass Transit Railway is running. Escalators and elevators don't move, TV and radio channels are silent, industrial machinery has ground to a halt, and even the stock exchange has ceased to function. By nightfall, instead of being illuminated by its famous neon lights, "the city that never sleeps" would be shrouded in darkness.

Thanks to Hongkong Electric Company, this scenario is unlikely to occur, except perhaps in the imaginations of its 536,000 customers. For 112 years, the company has energised the city's live-wire Central District and maintained a steady flow of power to the people.

Hong Kong's emergence as an economic dynamo would not have been possible without its continuous supply of electricity, delivered with unobtrusive efficiency. The company's enviable record stands as testimony to solid management and a commitment to deploying the best technology.

"We are in the elite group as far as reliability is concerned," says K.S. Tso, Group Managing Director of Hongkong Electric Holdings (HEH), Hongkong Electric's parent company. "Last year marked the sixth year in a row that the company achieved supply reliability of 99.999%, a record that only a handful of cities in the world can hope to match."



Hongkong Electric supplies all the power that illuminates and energises Hong Kong Island. From left: The stock exchange; city tram; The Peak Tower.

## TRACK RECORD

The company started operations at the 100kW Wan Chai power station on December 1, 1890 when electric streetlights were turned on in Central for the first time.

As the city developed, demand for electricity grew, and in 1919 a new 3MW power station opened at North Point. In 1968, a state-of-the-art power station was commissioned, this time at Ap Lei Chau. This facility had an installed capacity of 1,061MW when it was fully developed, meeting the requirements of a city that was now entering the global limelight.

The Lamma Power Station project was commissioned in 1982. To hedge against volatile oil prices it was designed to generate power primarily through coal firing instead of oil, with gas turbines on hand as back-up in emergencies. Today, Lamma Power Station is the sole generator of power for Hong Kong and Lamma islands with a capacity of 3,305MW, including eight coal-fired and seven gas-turbine units.

By global standards, the 50-hectare site at Lamma is compact, but the machinery it houses is among the most advanced. Consequently, the plant is immaculately run with none of the clutter and debris one might expect to find in such a set-up, and people are conspicuous, in large part, by their absence.

“We use computer technology to control most of the plant’s work,” says Technical Services Engineer Kam Wing Fai. “But the human element is of course still crucial to oversee all operations.”

## HUMAN DYNAMOS

Mr Tso stresses the vital contribution of the employees. “While the technology is pivotal in providing superior service delivery, the company owes much of its considerable success to a workforce that is highly motivated and experienced,” he says.

“At Lamma Power Station, new recruits – mainly engi-

neering graduates – enter an atmosphere where it is easy to learn from their more experienced seniors. We train our employees thoroughly and make sure they can benefit from on-going professional education. Simulators are used to continuously hone their skills and many are sent abroad for further training.”

By Hong Kong’s standards, staff turnover is insignificant at barely 3% to 5% per year, mainly from retirements. There are even instances of three generations of one family working for the company at the same time.

“It is very important to have mutual understanding with the people who work for you,” Mr Tso adds. “We share a common vision: every staff member is dedicated to contributing to the smooth running of the operation.”

This unwavering focus on increasing efficiency and productivity has produced extraordinary results: over the past 10 years, units sold per employee have soared 83%.

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## CENTRAL CONTROL

Once generated, the electricity flows through submarine cables from the power station to Hong Kong Island. It is at the System Control Centre at Ap Lei Chau that the company’s technological edge is most apparent. A gleaming haven of silent efficiency, the System

Control Centre deploys some of the most advanced equipment ever seen in the business, enabling remote control of the power generation process, transmission, and each of the 3,444 distribution substations. Engineers monitor wall-sized screens that show the entire distribution network, allowing them to pinpoint and remedy problems accurately and effectively within minutes.

“Power distribution systems worldwide rely on a similar system of distribution substations, but very few are remotely controlled from a single centre, and fewer still can boast the sort of technology employed at the System Control Centre in

## POWERFUL SERVICE



**A**T MIDNIGHT ON JUNE 30 1997, MILLIONS OF people across the world watched the Handover ceremony at the Hong Kong Convention and Exhibition Centre, which was attended by thousands of guests, including China's President Jiang Zemin and Britain's Prince Charles.

While the world's attention was focused on the historic event in Wanchai, a special Hongkong Electric task force, headed by the Group Managing Director K.S. Tso himself, was working behind the scenes to ensure there would not be the slightest disturbance or flickering in the supply network.

For six months, the task force had been implementing a meticulous plan to meet the unique challenges posed by the Handover. In all, the task force worked 1,500 man-days, and more than 130 staff were on standby on the big night.

Unsurprisingly, the company's efforts went virtually unnoticed, which translates to a high level of customer satisfaction. "We aim to give whatever we can for the convenience of our customers," says Mr Tso. "Our staff take it as a personal challenge to meet the customer service standards. We use a charter of 18 service standards to ensure that all customer services are first-rate. Standards in 2001, for example, set the average time for supply restoration after interruption at within two hours; the average waiting time for counter services at the Customer Centre at less than three-and-a-half minutes; and the average waiting time for telephone calls to the Customer Emergency Services Centre at less than 10 seconds."

All 18 pledges were comfortably met and exceeded last year, as they are every year.

Mr H.K. Lung, one of the most experienced members of the Emergency Services Unit, believes that the number of commendations the company receives each year provides ample proof of its dedication to customer service.

In 2000 and 2001, the company received 1,730 commendations from satisfied customers.

Mr Lung personally receives 30-40 thank-you letters from happy customers each year, and has been the recipient of several company service awards.

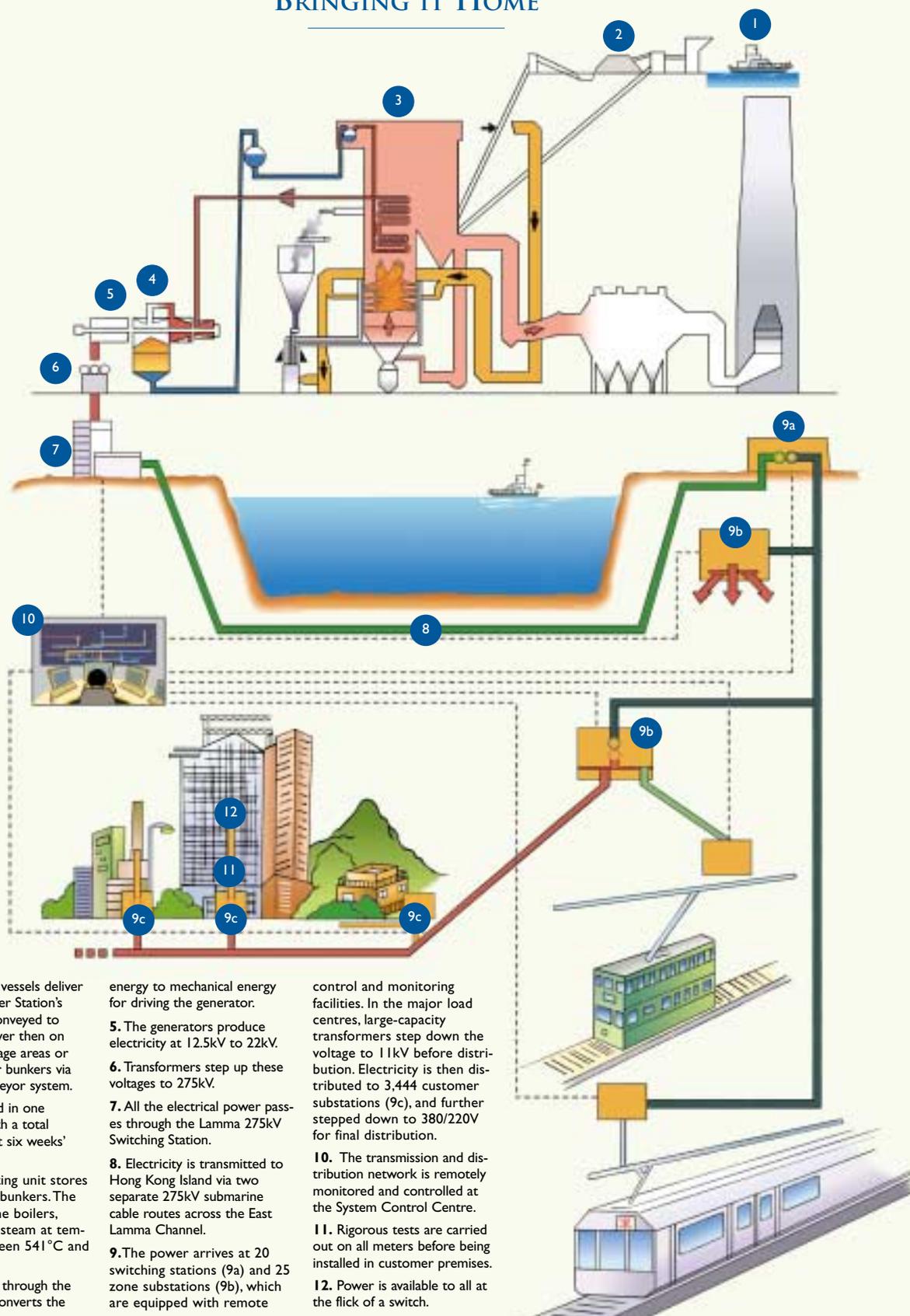
"The intention to help is the most important element in customer service," says Mr Lung. "People should feel it really comes from the heart."

Hongkong Electric was first to introduce concessionary tariffs, in January 1994. Today such tariffs apply to various underprivileged groups, including the elderly, the disabled, single parent families and the unemployed who are on or have qualified for public assistance.

The company was also among the first of its kind to implement a Braille billing service, which came into operation in June 1993.

For the majority, these personalised services go unnoticed, but they make a huge difference to those affected. It is precisely this kind of approach that has led to such a high degree of satisfaction among Hongkong Electric's customers.

## BRINGING IT HOME



**1.** Ocean-going vessels deliver coal to the Power Station's dockside. It is conveyed to the junction tower then on to the coal storage areas or fed to the boiler bunkers via a duplicate conveyor system.

**2.** Coal is stored in one storage yard with a total capacity to meet six weeks' consumption.

**3.** Each generating unit stores coal in five coalbunkers. The coal is fed to the boilers, which produce steam at temperatures between 541°C and 569°C.

**4.** Steam passes through the turbine, which converts the

energy to mechanical energy for driving the generator.

**5.** The generators produce electricity at 12.5kV to 22kV.

**6.** Transformers step up these voltages to 275kV.

**7.** All the electrical power passes through the Lamma 275kV Switching Station.

**8.** Electricity is transmitted to Hong Kong Island via two separate 275kV submarine cable routes across the East Lamma Channel.

**9.** The power arrives at 20 switching stations (9a) and 25 zone substations (9b), which are equipped with remote

control and monitoring facilities. In the major load centres, large-capacity transformers step down the voltage to 11kV before distribution. Electricity is then distributed to 3,444 customer substations (9c), and further stepped down to 380/220V for final distribution.

**10.** The transmission and distribution network is remotely monitored and controlled at the System Control Centre.

**11.** Rigorous tests are carried out on all meters before being installed in customer premises.

**12.** Power is available to all at the flick of a switch.



An aerial view of the Lamma Power Station, left, and the coal storage area, above.

HONGKONG ELECTRIC (6)

Ap Lei Chau,” says Paul Cheng, Chief System Control Engineer. “The engineers comfortably anticipate most customer emergency calls. It is very rare for an emergency call to catch our team unawares.”

So, while the logistical complexity of achieving 99.999% supply reliability might be enough to short-circuit the human brain, the System Control Centre ensures this figure is met, and often surpassed, every minute of the day.

### GROWING THE BUSINESS

In the past few years, HEH has embarked on a strategy of extending its operations.

Robust returns from Hongkong Electric, boosted by a “sovereign” credit rating from Standard & Poor’s have enabled Hongkong Electric to secure competitive financing for business expansion.

“We had a wonderful year in Australia last year,” Mr Tso recalls, “it was very hot.”

But if glorious days on a beach “Down Under” spring to mind, think again. Mr Tso is referring to the company’s Australian utilities investments in Victoria and South Australia.

In January 2000, Hongkong Electric International (HEI), a wholly owned subsidiary of HEH, together with Cheung

Kong Infrastructure (CKI), acquired under a 200-year lease the Electricity Trust of South Australia (ETSA), the major electricity distribution company serving the state of South Australia. In August 2000, HEI/CKI also acquired Powercor Australia Limited (Powercor), the largest of the five distribution/retail companies in the state of Victoria.

With these two deals, which had a combined worth of A\$5.565 billion (about US\$3.1 billion), HEI/CKI became the largest electricity distributor in Australia, serving over 1.4 million customers.

Both companies have provided solid returns, and last year the sale of Powercor Australia’s retail division resulted in a one-off gain of HK\$344 million (US\$44 million) for HEI.

“The company’s philosophy is to invest in companies with predictable returns and relatively low risks,” Mr Tso says. “This is the thinking behind our Australian acquisitions; it is a regulated business with returns that are fixed by a formula.”

He notes that HEI has timed its acquisitions well. “Share prices of utility companies reached historic highs in the mid-90s, but came down to more realistic levels following global market turmoil in 1997. Prior to this, we viewed power utilities as overpriced. Now we are looking to consolidate our Australian successes and add to our portfolio.”



In recent months the company has planned to invest (through a 26% stake in Union Power Development) in building a HK\$9.8 billion (US\$1.26 billion) power plant in Thailand that will consist of two 700MW coal-burning plants.

Again, returns are highly predictable as the power station has a power purchase agreement with the Electricity Generating Authority of Thailand, which is state owned. The project is at the final stage of securing approval from the Thai government.

With an investment philosophy that bears obvious rewards, it is little wonder that shareholder confidence is high. In 2001, net profit rose 18% to HK\$6,507 million.

"Many of our 16,300 shareholders invest in our company because of its stable earning power," Mr Tso observes.

### BRIGHT FUTURE

Because electricity is such a vital commodity, it is not uncommon globally for governments to exercise some form of regulatory control.

Hongkong Electric is party to the Scheme of Control Agreement with the SAR Government, under which utility companies are seen to balance the benefits for both customers and shareholders.

The scheme safeguards consumers by ensuring them of reasonable tariffs and reliable services. In turn, shareholders receive a specified "permitted return" provision for their long-term investments.

The Agreement is set to expire in 2008 and Mr Tso is confident that a new arrangement will prove agreeable to all parties.

Taking the long view, Hongkong Electric has begun work on the fourth stage of the Lamma Power Station to cope with electricity demand that continues to grow at between 3% and 5% per year.

Some observers believe a fully liberalised electricity market would better serve consumers. Others argue that liberalisation is impractical, especially in a territory defined by its critical shortage of suitable sites and a relatively small market.

It is unlikely that significant market liberalisation would reduce costs to consumers or improve on the already near-perfect reliability. True, Hongkong Electric is the sole utility provider in its domain, but it nevertheless is a highly competitive operation, constantly balancing the interests of its customers, the environment and shareholders while achieving ever-greater efficiency.

As the record shows, the company has been well plugged in to its environment for almost 112 years. It is also impeccably equipped to illuminate the future.



The Admin Building at Lamma Power Station.

## CLEAN, GREEN AND UNSEEN

A CENTURY AGO, "ENVIRONMENTAL PROTECTION" was almost unheard of, but that did not stop Hongkong Electric from taking steps to improve the burgeoning city's environmental safety. In 1902, smoke from the company's Wan Chai power station posed an environmental risk to Hong Kong's Central Business District. To remedy the problem the company immediately purchased smoke-consuming apparatus from England. At the next general meeting, Hongkong Electric's chairman pledged that the company would no longer produce such emissions, eliciting a round of applause from the gathered shareholders.

One hundred years later, Hongkong Electric continues to take its role as a responsible corporate citizen very seriously. Working closely with the Government's Environmental Protection Department, the company has successfully implemented a HK\$4.9 billion (about US\$628 million) programme to raise environmental standards to levels much higher than those required under existing legislation.

"We make every possible effort to ensure our operations are environmentally sound. We maintain stringent controls to prevent air, noise and water pollution, we recycle waste, and we actively protect and enhance the natural landscape," says Group Managing Director K.S. Tso. "State-of-the-art technologies are adopted whenever practical and commercially available to ensure the environmental impact of our operation is kept to a minimum."

To maintain air purity, a flue gas desulphurisation system removes at least 90% of sulphur dioxide emissions. Low nitrogen oxide burners are deployed in coal-fired boilers to reduce by two-thirds concentration of NOx in the flue gas. Electrostatic precipitators clean furnace gases further before discharge from the 215m-high chimneys, dispersing emissions away from populated areas. Meanwhile, monitoring stations on Hong Kong and Lamma islands keep check on ambient air quality.

The company also employs comprehensive waste-recycling strategies. "There is very little waste that is not recycled from the Lamma Power Station," notes Technical Services Engineer Kam Wing Fai, who is charged with honing the plant's efficiency. "For example, coal ash and gypsum by-products are sold to be used for construction materials."

With an idyllic location overlooking the West Lamma Channel, the company pays equally close attention to the surrounding waters. Local anglers testify that fish are plentiful, attracted perhaps by the flow of warm water which, having cooled the plant, is pumped back into the sea. Furthermore, the company has co-sponsored a research study on the use of coal ash as artificial reefs for marine conservation.

The plant's location has presented the company with an added environmental challenge. Power reaches Hong Kong Island on its south side but most of it is consumed on the north side, with a chain of picturesque hills in between. The traditional solution would be to use overhead transmission lines, but despite their relatively low cost, installation of these would be disruptive and would require excavation in some of Hong Kong's country parks.

"So the company took a more difficult, but environmentally sensitive approach – tunnelling through the mountains," says Chief Engineer (Transmission & Distribution) S.S. Yuen. "Two tunnels were built, keeping the cables out of sight and conserving Hong Kong Island's natural beauty."

At the other end of the supply chain, Hongkong Electric has made every effort to ensure that its network of 20 switching stations, 25 zone substations and 3,444 distribution substations blend in. "The substations are designed to achieve a perfectly harmonious relationship with the environment," Mr Yuen explains. "Each location is unique, so each substation is specially designed to fit its surroundings."

Hongkong Electric also supports research on renewable energy and alternative fuel sources. It has sponsored a research project into wind power on Hong Kong's Po Toi and Lamma islands, solar energy research at the University of Hong Kong, and has invested in electric vehicles for its own use.

Of equal value have been the company's efforts to promote the efficient use of energy. It co-sponsors an Energy

Efficiency Centre at the Hong Kong Science Museum, and provides energy-efficient teaching kits for primary schools.

Furthermore, the company conducts and sponsors corporate afforestation schemes in Hong Kong and China. On Lamma, for example, over 50% of all trees were planted by Hongkong Electric.

In June 2000, the Hong Kong Government approved a company proposal to extend the Lamma Power Station. The government noted that when the six new 300MW gas-fired units are completed, total annual gas emissions are set to drop by as much as 60% while electricity generated will increase 43%.

"Contrary to the general perception," the Government noted in a report, "the Lamma Extension Project would in fact bring considerable environmental benefits in reducing the overall emissions."

Not only is Hongkong Electric fully prepared to meet electricity needs well into the new century but it is also fully committed to maintaining a clean and safe environment for future generations.

