第四章 **Chapter 4**

節省能源
Energy Conservation

在2000年內的發展

在2000年初，位於航空交通管制大樓以北的備用航空交通管制大樓已投入運作，以備一旦主要航空交通管制設施受火警或嚴重事故影響不能運作的情況下作為應急之用。備用大樓設有備用航空交通管制中心、備用指揮塔和備用航空通訊中心。在2000年內，這些備用設施亦曾作為航空交通管制訓練及熟習機場運作練習之用。另外，一個小型飯堂於2000年8月在備用大樓內啟用。由於備用大樓是位於機場禁區範圍內，因此不能使用煤氣及石油氣，而電力則是它唯一耗用的能源。

在2000年9月尾，為了配合技術及策劃部的電子工程組的擴充，民航處在機場空運中心增加了117平方米辦公室樓面面積。

就2000年訂立的目標所作出的努力及成果

- 設立基準數據及準則以監控民航處各辦事處的耗電量

我們在位於金鐘政府合署的民航處總部辦公室安裝了獨立電錶，以記錄電力的耗用情況，及從而找出可以進一步減低耗電量的地方。總部辦公室的電力耗用基準數據和備用大樓首年運作的耗電量數據已於2000年收集妥當。

Development in 2000

In early 2000, a Backup Air Traffic Control Complex (BATCX), located to the north of the main Air Traffic Control Complex (ATCX), was put into contingency use in case of fire or serious mishaps affecting the main air traffic control facilities. The BATCX houses the Backup Air Traffic Control Centre, the Backup Aerodrome Control Tower and the Backup Communications Centre. The facilities have been used for air traffic control training and familiarization in 2000. In August 2000, a small canteen was opened in BATCX. As it is located in airside area, use of town gas or LPG is not allowed. Therefore, electricity is the only source of energy in use.

In end September 2000, our offices at Airport Freight Forwarding Centre (AFFC) were expanded by 117 m^2 to accommodate the additional staff of Electronics Engineering Section.

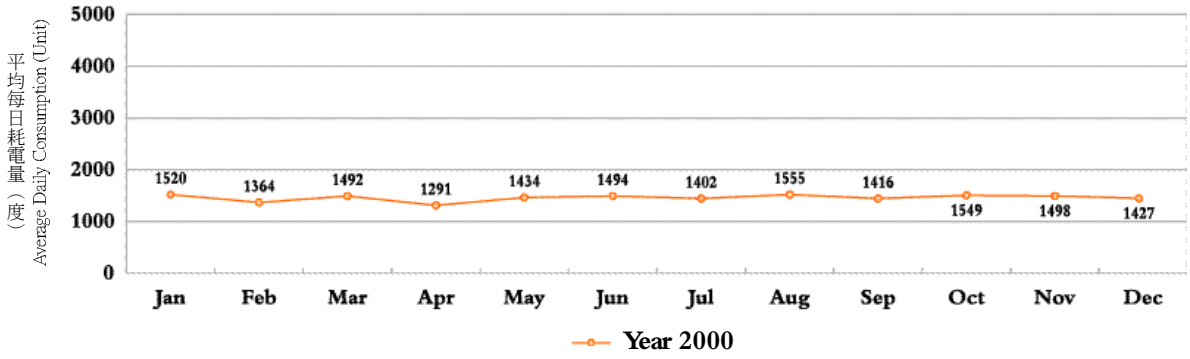
Progress against targets

- **Establish base figures and yardstick for controlling electricity consumption in various CAD offices**

In order to improve our ability to track energy consumption and consequently target areas for improvement, a separate meter was installed at CAD Headquarter at Queensway Government Offices (QGO). The base electricity consumption figures for the headquarter offices were collected. For the BATCX, the electricity consumption figures for the first year of its operation were also collected.

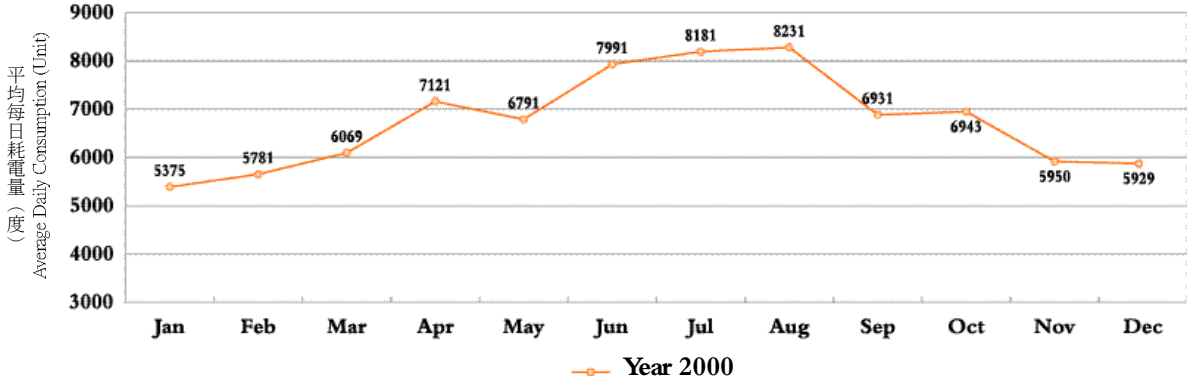
圖五：位於金鐘政府合署的民航處總部的2000年用電量記錄

Diagram 5: Electricity Consumption in CAD offices at Queensway Government Offices in 2000



圖六：備用航空交通管制大樓的2000年用電量記錄

Diagram 6: Electricity Consumption in BATCX in 2000



- 探求及採用節約能源的措施

我們節約能源的目標是要減低能源的消耗及改善能源的效益。根據機電工程署在1999年於航空交通管制大樓進行的能源審核的結果，我們考慮了一些措施以進一步節省能源，結果概述如下：

(a) 我們準備用電子鎮流器來取代現時安裝在航管大樓內電光管組件中的電感式鎮流器。更換工程預算在2001年第一季進行。據估計，更換電感式鎮流器可減低30%耗電量，每年大約可節省港幣60,000元電費。

(b) 現正物色適合的諧波調節器以裝置在航管大樓及備用大樓的供電系統，從而幫助改善供電系統的能源效益。

- **Explore various initiatives in energy saving**

Our target of energy saving is geared towards the reduction of energy consumption and improvement of energy efficiency. Based on the findings of the energy audit conducted by EMSD in 1999 at ATCX, which houses the Air Traffic Control Centre and Air Traffic Control Tower, we contemplated a few measures as part of our continuous efforts in energy conservation. The results are as follows:

(a) Procurement of electronic ballasts to replace the electro-magnetic ballasts of all the fluorescent light tubes installed in ATCX was in progress. The replacement work was scheduled to be carried out in the first quarter of 2001. It is estimated that the replacement of electro-magnetic ballasts with electronic types will reduce energy consumption by about 30%. The annual energy cost saved by the use of electronic ballasts is estimated to be $60,000.

(b) Suitable harmonic conditioners are now being identified for installation to the electricity supply system of the ATCX and the BATCX. The harmonic conditioners can help to improve the overall energy efficiency.

(c) 有關在航管大樓的公用地方裝置移動探測器，以確保空調及燈光在房間空置了一段時間後會自動關上的措施，我們在成本效益方面進行了詳細的研究。由於該裝置的成本高昂及預期使用率低，此措施已暫時被擱置。

除了由民航處負責大廈管理的航管大樓及備用大樓外，民航處亦已就其他位於金鐘政府合署、機場客運大樓及機場空運中心的辦公室，向有關管理當局表達我們對節約能源的關注。我們曾向金鐘政府合署大廈管理處反映我們對「用電需求管理計劃」的支持。「用電需求管理計劃」是一項由中華電力有限公司、香港電燈有限公司及政府共同推行的計劃，目的在維持本港有穩定充足電力供應的同時，促進善用及節約能源。此計劃包括一個向非住宅用戶提供部份安裝成本回扣優惠的措施以鼓勵他們更換高效能照明及空調設備。

- 購買能源效益高的儀器

作為一個對環境負責任的機構及支持政府對環境保護的承擔，我們有義務依從中央訂定的環保採購指引。在可行的情況下，我們會把環保要求，如高循環再造性及高能源效益等條款，放在標書細則中。

- **維持耗電量的增長低於香港國際機場的**航空交通增長

2000年的客貨運處理量分別達3,340萬人次及224萬噸，較1999年上升了9.8%及13.3% 。飛機升降數目亦增至181,900架次，相對1999年上升了8.7%。雖然航空交通量有不少的增長，但是航管大樓2000年的平均每日耗電量（15869度）卻較去年下降了0.3%。這個成果相信是歸因於在2000年實施了的多項省電措施及員工對節約能源的重視。不過，機場空運中心2000年的平均每日用電量增至586度，較1999年增加了15%。這是由於兩個原因：第一，技術及策劃部的電子工程組就新的衛星航空交通管制系統加裝了新的電腦設備；第二，位於機場空運中心的辦事處擴大了，以應付電子工程組的擴充。

(c) A detailed study on the cost effectiveness of installing automatic occupancy sensors at the common use areas of the ATCX to turn off lighting and air conditioning automatically when an area is not in use was carried out. However, in view of the high equipment cost and the expected low utilization rate of the measure, it was decided to put in abeyance this option.

Apart from ATCX and BATCX of which the building management is under the purview of CAD, for other CAD offices in QGO, Passenger Terminal Building of HKIA and AFFC, our concern on energy conservation has been expressed to the relevant parties. We conveyed to the Building Management of QGO of our full support on the Demand Side Management Programme (DSMP) launched by the two power companies, CLP Power Hong Kong Ltd and Hongkong Electric Company Limited, and the Government, to promote energy efficiency and conservation while maintaining reliable and adequate electricity supply in Hong Kong. The programme encourages the installation of energy efficient lighting and air-conditioning equipment by rebating part of the installation costs.

- **Purchase equipment of high standard of energy efficiency**

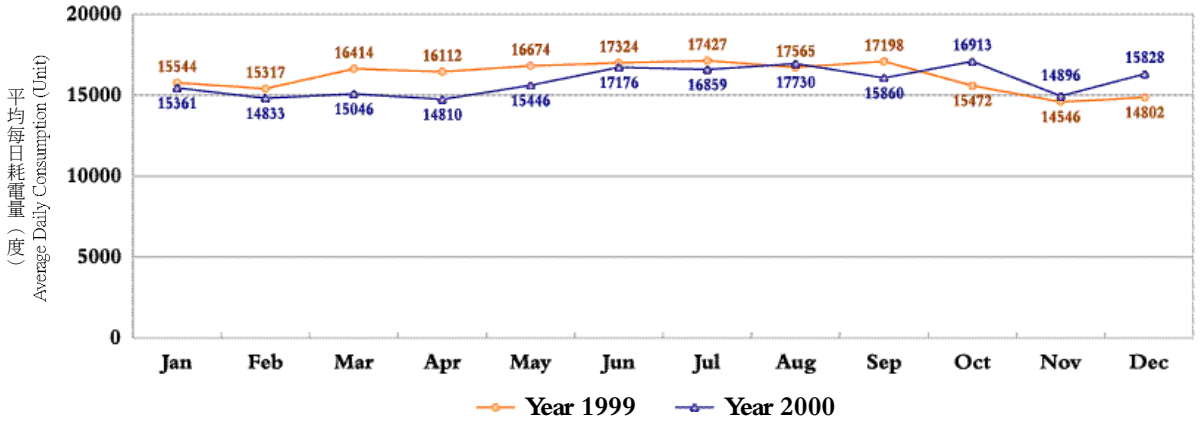
As an environmentally responsible organization and in support of Government's commitment to environmental protection, we are obliged to observe central guidelines for green purchasing and take environmental considerations into account when procuring goods and services. Environmental terms such as high standard of recyclability and energy efficiency have been included in tender specifications whenever applicable.

- **Maintain the growth in electricity consumption at a level below the traffic growth at HKIA**

In 2000, passenger and cargo throughput reached 33.4 million and 2.24 million tonnes respectively, represented a rise of 9.8 % and 13.3 % over 1999. Aircraft movements also increased to 181,900, a rise of 8.7% over 1999. In spite of the growth in air traffic, average daily electricity consumption in ATCX in 2000 decreased by 0.3% comparing to 1999, amounted to 15869 kilowatt-hours. The implementation of various energy saving initiatives implemented coupled with increased consciousness of staff to energy conservation were believed to be major factors contributing to the lower electricity consumption in 2000. For AFFC, the average daily power consumption however was increased to 586 kilowatt-hours, a 15% rise over 1999. The increase was attributed to two main reasons. Firstly, additional new computer equipment was installed in the office of Electronics Engineering Section of Technical & Planning Division for the new satellite-based CNS/ATM systems. Secondly, the offices at AFFC had been expanded to cater for the expansion of Electronics Engineering Section.

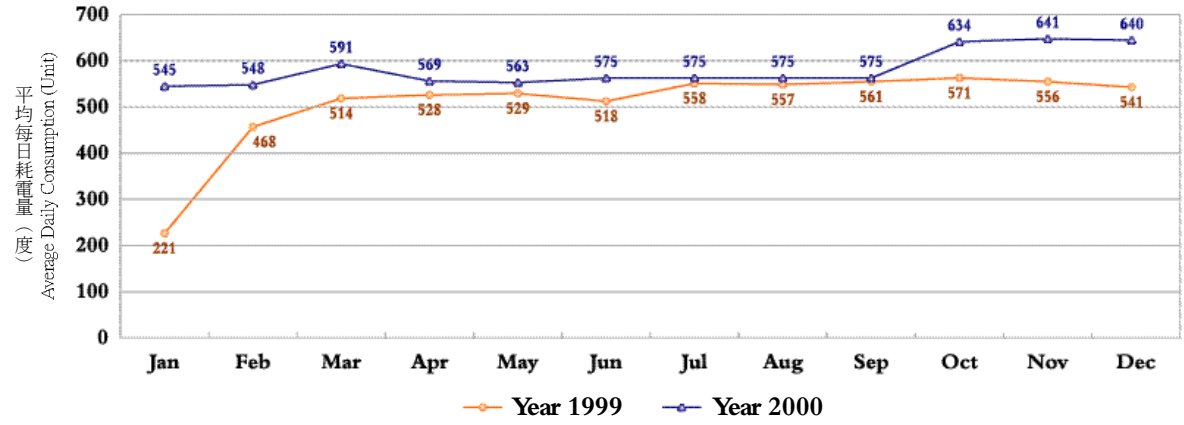
圖七：航空交通管制大樓及控制塔的用電量記錄

Diagram 7: Electricity Consumption in ATCX/TWR



圖八：民航處設於機場空運中心的辦公室用電量記錄

Diagram 8: Electricity Consumption in CAD Offices at AFFC



2001 年的新目標

- 完成在航管大樓內，以高能源效益的電子鎮流器取代電光管組件中的電感式鎮流器的工程。
- 維持2001 年耗電量的增長低於這年度內航空交通在飛機架次方面的增長。

New targets in 2001

- **Complete the installation of more energy efficient electronic ballasts to replace the electro-magnetic ballasts of all the fluorescent light tubes installed in ATCX.**
- **Maintain the growth in electricity consumption at a level below the traffic growth, in terms of aircraft movements, in 2001.**