



## Customer Success Story

### Hongkong Land Embraces Sustainability with Trane's New Climate Solution

#### Project Highlights

<b>Customer Name</b>	Hongkong Land (Property Management) Limited
<b>Building Location</b>	LANDMARK, Central, Hong Kong
<b>Products Used</b>	Trane® CenTraVac® Water-Cooled Centrifugal Chillers @HFO R514A

#### The Challenge

From designing environmentally responsible properties to supporting the communities, sustainability is at the heart of the business of Hongkong Land (Property Management) Limited (“**Hongkong Land**”). Among its key strategies are utilizing leading technologies and adopting best environmental practices to mitigate the impact on climate change across its properties.

LANDMARK, a commercial complex owned by Hongkong Land and located in the core business area of Central, consists of three top-tier office towers. Hongkong Land was in search of a sustainable solution to reduce its energy footprint in two of these office towers – Gloucester Tower and Edinburgh Tower, as the chiller plant systems there contributed to a huge proportion of power consumption, and the breakdown maintenance cost continued to increase as the systems aged.

To solve these issues, Hongkong Land needed to retrofit the existing chiller plant systems to improve energy performance.

#### Trane's Solution

With the phase-down of hydrofluorocarbon (HFC) refrigerants having been put on the agenda by global climate organizations, [Trane Hong Kong](#) is well prepared to help building managers take the next step in their sustainability journey.

By retrofitting the existing R134a water-cooled chiller plant with an energy efficient and eco-friendly [Trane® R514A CenTraVac® Water-Cooled Centrifugal Chiller](#), Trane was able to help optimize the chiller plant operations, with mixed use of fixed- and variable-speed chillers. Moreover, thanks to the more robust chiller designs, the solution also helped reduce the breakdown maintenance costs.





*The 2,200-ton Trane® Duplex™ CenTraVac® chiller @HFO R514A*

Trane's solution helped optimize operating efficiency and dramatically lower energy costs. Through simplicity in design, Trane R514A CenTraVac chillers feature a direct-drive multi-stage compressor with a semi-hermetic motor design which ensures stable and reliable operation as well as industry-leading efficiency. R514A achieves the highest performance among all next-generation refrigerant options today, with zero Ozone Depleting Potential (ODP) and Global Warming Potential (GWP) of less than 2.

In case of higher cooling capacity demand, Duplex™ chillers with a series-counterflow design and dual independent refrigerant circuits leverage thermodynamic staging to achieve unmatched energy performance.

### **Project Implementation**

The project implementation process requires a great deal of coordination. Trane's task is to direct and manage each step of the way to make the project successful in its vision.

- **Site Survey and Chiller Selection**

One of the initial tasks was to determine the chiller selection and combination for the LANDMARK chiller plant. Trane worked with a mechanical, electrical, and plumbing (MEP) consultant to simulate and develop an energy model to pinpoint a scheme with the best energy performance. The project team also conducted several site surveys to identify the site constraints for arranging the chiller plant layout and potential difficulties during the chiller delivery. The chiller selection process struck a balance between chiller efficiency and dimensions to address both the requirements of coefficient of performance (COP) and site space constraints.

- **Project Fulfilment and Chiller Delivery**

In addition to the major benefits brought by this project to Hongkong Land and its tenants, Trane has achieved its own technical innovation during the project implementation.

At this stage, the biggest challenge Trane faced was to safely deliver all chillers to the chiller plant. Thus, a self-propelled trailer was employed to move the chiller components. The trailer has 24 wheels with twin tires which provide extremely high traction force and flexibility of movement especially when turning. This innovation made the whole delivery process safer and more efficient than the traditional method.



The Trane team also dismantled the existing chillers and safely disposed of the R134a refrigerant and lubricating oil to avoid environmental and health hazards.

- Testing and Commissioning – the Crucial Stage

At last, the project team conducted comprehensive testing and commissioning including field performance tests on both full- and part-load operations of the chiller systems to ensure that the full capacity and expected benefits could be realized.

## Key Outcomes

The project utilized energy efficient chillers with R514A, an eco-friendly hydrofluoroolefin (HFO) refrigerant, to achieve outstanding chiller plant performance, resulting in lower energy use and operating costs, enhanced occupant comfort, and reduced greenhouse gas (GHG) emissions.

The project retrofitted the existing chiller plant with four 1,200-ton Simplex and two 2,200-ton Trane Duplex CenTraVac chillers at Gloucester Tower and Edinburgh Tower respectively. The project will bring the following benefits to Hongkong Land and its tenants in the two high-end office buildings.

- Low-pressure HFO refrigerant R514A with zero ODP and GWP of less than 2 offers the highest theoretical chiller efficiency among all refrigerants on the market. Users do not need to worry about facing refrigerant shortages or having to pay a high price due to phasing down of HFCs as required by Kigali Amendment<sup>1</sup>.
- The operating efficiency fully meets all COP specifications with the best full- and part-load efficiencies, achieving the lowest life-cycle costs and minimizing the overall GHG emissions.
- Duplex chillers with a series-counterflow design contribute to enhanced availability and energy efficiency.
- Strong after-sales service backup helps sustain superior system reliability.

“We are very pleased to have the opportunity to collaborate with Hongkong Land and other stakeholders in advancing the journey to sustainability,” said **Frankie Chan**, Managing Director of Trane Hong Kong, “The LANDMARK project has received high recognition from the customer. We’re confident that this not only fulfills our commitment to premier performance, superior customer service and world-leading expertise in climate solutions, but also sets an excellent example for more chiller owners in the real estate industry, especially those with sustainability ambitions.”

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<sup>1</sup> The *Kigali Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer* is an international agreement to gradually reduce the consumption and production of HFCs.

## 客戶成功故事

### 特靈溫控系統新方案助力香港置地擁抱可持續發展

#### 項目摘要

客戶名稱	香港置地（物業管理）有限公司
建築位置	香港中環置地廣場
使用的產品	配備 HFO 製冷劑 R514A 的特靈 CenTraVac® 水冷離心式冷水機組

#### 迎接挑戰

從環保建築設計到支援社區發展，香港置地（物業管理）有限公司（“香港置地”）一直以可持續發展為其業務核心。其主要戰略包括利用領先技術及採用環保最佳慣例，力求減輕其物業對氣候變化的影響。

置地廣場是香港置地旗下的綜合商業大樓，位於中環核心商業區，設有三座頂級辦公大廈。香港置地在尋求可持續的解決方案，以減少其中兩座辦公樓——告羅士打大廈及公爵大廈的能源足跡，原因是當中的冷水機組系統在大廈總電力消耗中的佔比相當大，並且故障維修成本亦隨著系統老化而不斷增加。

為解決這些問題，香港置地需要改造現有的冷水機房系統，以提升能源效益。

#### 解決方案

隨著全球氣候組織將逐步淘汰氫氟碳化物（HFC）製冷劑的計劃提上日程，[特靈香港](#)已經作好充分準備，協助大廈物業管理者邁出可持續發展之旅的下一步。

透過採用節能環保的[特靈 R514A CenTraVac® 水冷離心式冷水機](#)，對現有的 R134a 水冷式冷水機房進行改造，以及混合使用定速和變速冷水機，特靈可幫助客戶優化冷水機房的運作。而且，由於這些冷水機在設計上更加堅固耐用，該方案亦能幫助客戶降低故障維修成本。







配備 HFO 製冷劑 R514A 的 2,200 噸特靈 Duplex™ CenTraVac® 冷水機組

特靈的方案在優化運行效率的同時大幅降低能源成本。特靈 R514A CenTraVac 冷水機組設計簡單，配備採用半封閉電機設計的直驅式多級壓縮機，以確保機組能夠穩定可靠地運行及達致業內領先的效率。在目前可用的新一代製冷劑中，R514A 的性能最佳，臭氧消耗潛能值 (ODP) 為零，而全球變暖潛能值 (GWP) 小於 2。

在製冷需求較高的情況下，具有串聯逆流設計及雙獨立製冷劑迴路的 Duplex™ 冷水機組可利用熱力學分級來實現無與倫比的能源效益。

## 項目實施

項目實施過程涉及大量協調工作。特靈的任務是指導及管理每一步，令項目願景得以成功實現。

### ■ 現場勘測及冷水機組選擇

初始任務是為置地廣場的冷水機房選擇合適的冷水機組合。特靈與機械、電氣及水管裝置 (MEP) 方面的顧問合作，進行能源模擬及建模，以定出能實現最佳能源性能的方案。項目團隊還進行了多次現場勘測，分析布置冷水機房時的場地限制以及在交付冷水機組時可能遇到的困難，並在權衡冷水機組效率及空間尺寸之後選用冷水機組，以便符合效能系數 (COP) 的規定及克服場地空間的限制。

### ■ 項目履行及冷水機交付

該項目除了為香港置地及其租戶帶來重大效益，也讓特靈在項目實施過程中實現了自身的技術創新。



在此期間，特靈面臨的最大挑戰是將所有冷水機安全地運送到冷水機房。因此，我們採用自行式拖車運送冷水機組件。該拖車有 24 個雙輪胎車輪，具有極高的牽引力和移動靈活性，尤其是在轉彎時。這項創新使整個交付過程較傳統方法更為安全高效。

特靈團隊還拆除既有的冷水機組並妥善處理了 R134a 製冷劑及潤滑油，以避免對環境及健康造成危害。



- 測試與校驗 – 關鍵階段

最後，項目團隊對冷水機系統進行了全面測試和校驗，包括對其在滿負荷及部分負荷下的運行情況進行現場性能測試，以確保實現滿負荷功率及預期效益。

## 主要成果

該項目使用的節能冷水機組採用環保型氫氟烯烴（HFO）製冷劑 R514A，以實現出色的冷水機組性能，從而降低能源使用及營運成本，提高居住者的舒適度，並減少溫室氣體排放。

透過改造告羅士打大廈及公爵大廈的現有冷水機房，分別安裝四台 1,200 噸 Simplex 和兩台 2,200 噸 Duplex 特靈 CenTraVac 冷水機組，該項目將為香港置地及其兩座高端辦公大樓的租戶帶來以下好處：

- 在市場上所有製冷劑中，ODP 為零、GWP 小於 2 的低壓 HFO 製冷劑 R514A 的理論製冷效率最高，用戶無須擔心面臨製冷劑短缺或因《基加利修正案》<sup>1</sup>規定須逐步減少 HFC 而不得不付出高昂代價。
- 運行效率完全符合所有 COP 規範，具有最佳的滿負荷及部分負荷效率，能實現最低的生命週期成本並最大限度地減少整體溫室氣體排放。
- 採用串聯逆流設計的 Duplex 冷水機組提高可用性及能源效率。
- 強大的售後服務支援有助維持系統卓越的可靠性。

特靈香港董事總經理陳偉平表示：“我們非常高興有機會與香港置地及其他持份者合作，共同推進可持續發展。置地廣場項目獲得了客戶的高度認可。我們相信這不僅體現了我們對卓越性能及優質客戶服務的承諾，而且充分發揮了特靈全球領先的溫控系統解決方案的優勢，同時也為地產行業內更多使用冷水機組且致力於實現可持續發展的客戶展示了良好的示範效果。”

<sup>1</sup> 《〈關於消耗臭氧層物質的蒙特利爾議定書〉基加利修正案》是一項旨在逐步減少 HFC 的使用及生產的國際協定。