

食品飲料廠 用水效率提升與 水管理應用

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NALCO Water
An Ecolab Company





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水處理部門 區域經理/ Light area manager

經歷

2021~迄今 水資源管理

2015~2021 輕工業水處理

2010~2015 重工業水處理

管理區域

雲林/中彰投/南苗栗

水管理與水效率

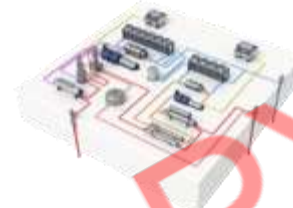
水的管理應用在食品飲料廠



砂濾/活性炭塔化學處理



冷卻水管理



密閉冷卻水管理



製程水處理



預處理/逆滲透水管理



鍋爐水化學處理



廢水管理



污泥脫水減廢化學處理

減量 | 回用 | 循環



用水率提升-冷卻水問題挑戰



管路腐蝕



管路點蝕



結垢沈積

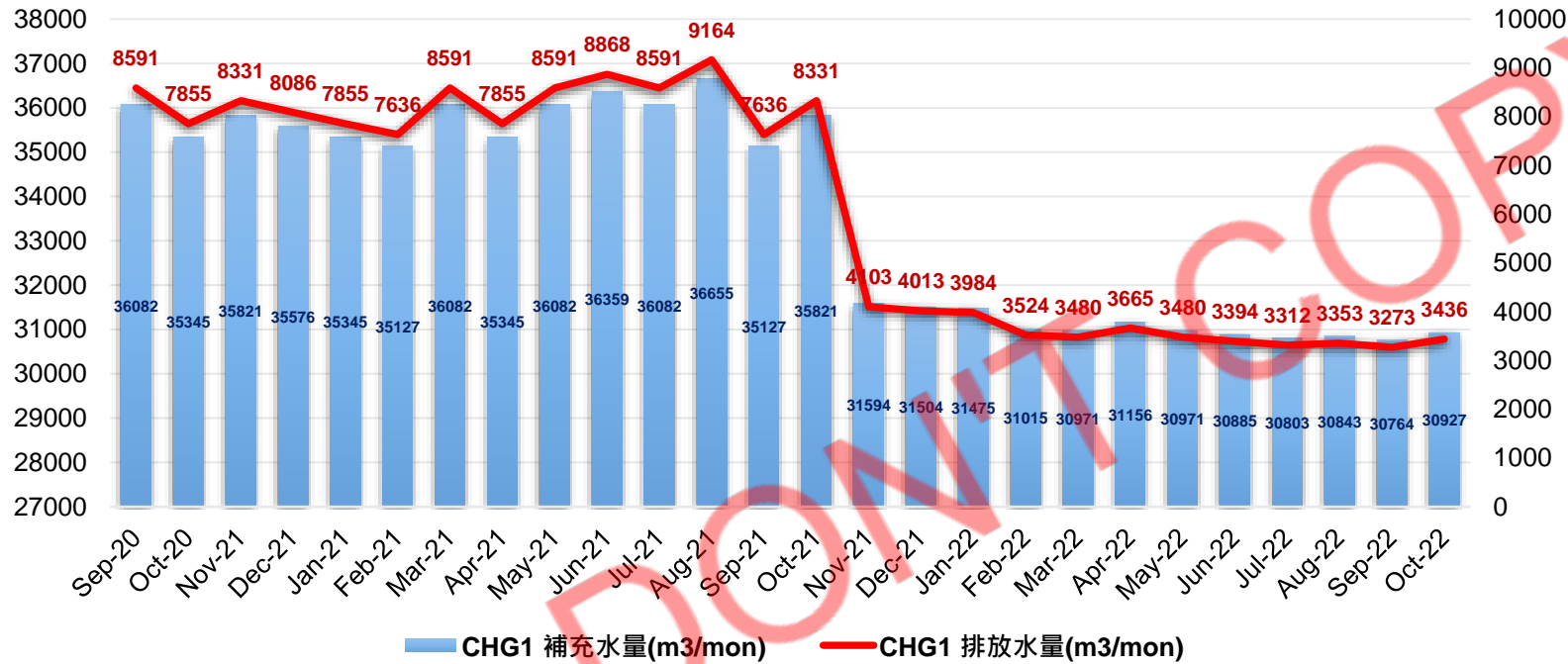


微生物/細菌

節水案例

完善的水處理

Water usage 2021.10~2022.10



濃縮倍數



完善的方案



優化的設備



服務創新



127,942 M³

WATER

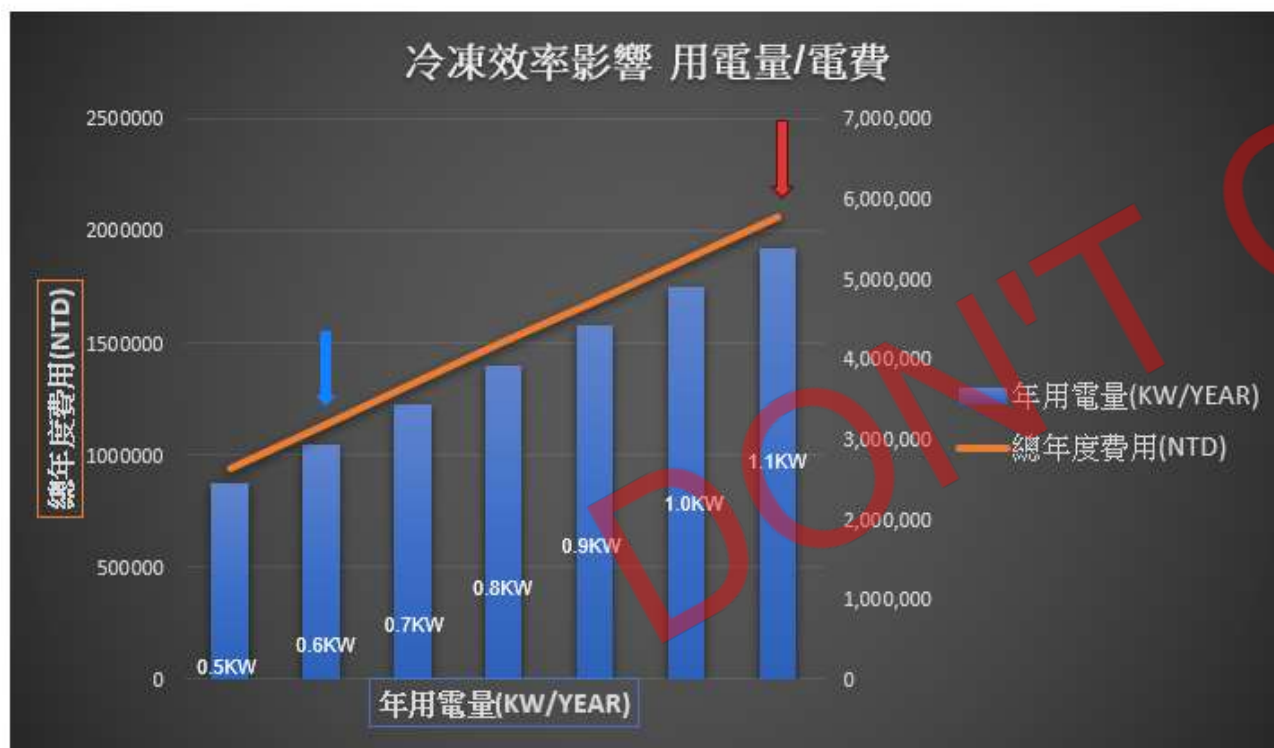


3,861,072

COSTS

能耗的節省

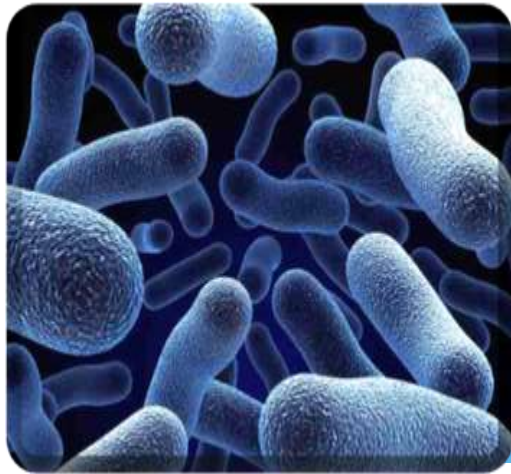
完善水處理=SAVING ENERGY
87600 KW
\$2,628,000



200RT冰水主機
1 KWH = 3 NTD

冷凍效率(KW)	年用電量(KW/YEAR)	總年度費用(NTD)
0.5	87600	2,628,000
0.6	1051200	3,153,600
0.7	1226400	3,679,200
0.8	1401600	4,204,800
0.9	1576800	4,730,400
1.0	1752000	5,256,000
1.1	1927200	5,781,600

冷凍效率(kW/冷噸)	冰機狀況
<0.5	非常完美
0.5-0.6	非常有效率
0.6-0.8	典型的普通冰機
0.8-1.0	效率較差
>1.0	效率極差



風險管理

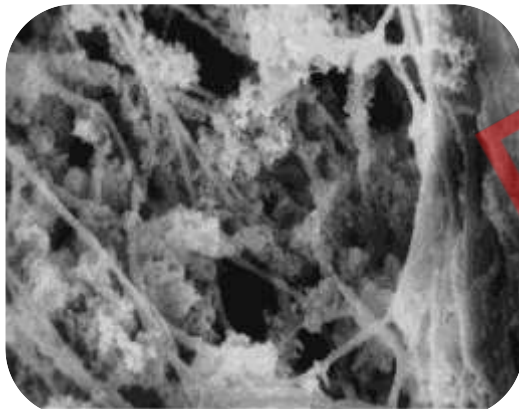
緊急補救方案

長期微生物控制方案

健康安全的問題

費用 / 沈積腐蝕

設備維修停機 / 預防 > 緊急



Fouling Factor	Film Thickness	Additional Energy	Additional KWHrs	Additional Energy Cost
0.0005	0.15 mm	5.3 %	193,000	\$ 13,500
0.001	0.30 mm	10.8 %	386,000	\$ 27,000
0.02	0.61 mm	21.5 %	843,000	\$ 59,000
0.03	0.91 mm	32.2 %	1,186,000	\$ 83,000

公共衛生問題-冷卻水退伍軍人菌及微生物



Legionnaire's Bacteria Found in NYC Hospital Water

Dayton Daily News

Legionnaires' disease outbreak largest in Ohio since 2004

By Ben Sutherly, Staff Writer
Updated 11:27 PM Thursday, March 10, 2011

DAYTON — Miami Valley Hospital confirmed its 10th case of Legionnaires' disease making the outbreak the largest in Ohio in nearly seven years.

Source Of Legionnaires' Outbreak Found

Decorative Water Feature Blamed For Disease Outbreak

POSTED: 4:38 pm CDT March 17, 2010
UPDATED: 8:02 pm CDT March 17, 2010

MILWAUKEE -- The source of the Legionnaires' disease outbreak has been found.

Officials with Aurora St. Lukes South Shore Hospital -- along with the Cudahy and Milwaukee health departments -- said that the culprit was a decorative water feature in the entrance of the hospital.

Spokane hospital fighting Legionnaires' Disease

29 Apr - Legionnaires', Sacred Heart Medical Center, Spokane, (confirmed cases: 2, confirmed deaths: 1) SPOKANE, Wash. Patients at Sacred Heart Medical Center drink while the hospital cleans its water system to remove the disease. Three patients have come down with the disease.

Confirmed case of Legionnaires' disease at St. Ann's Community in Rochester

It's a bacterial disease that could cause pneumonia and the water at St. Ann's in Rochester along with one of their residents have tested positive for the disease.

It's called Legionnaires' disease and it's the first time in more than 25 years Legionnaires' has been treated and is fully recovered. Show the New York State Health Department is working closely with St. Ann's to develop a plan for making sure their water is safe again.

In the meantime, the town is only using bottled water for drinking and hygiene. The health department has supplied them with soap for bathing that doesn't require water.

Water fountains and hospitals, not a good mix

By John Fauber of the Journal Sentinel

退伍軍人菌及微生物防治

病原菌
繁殖



氣霧
擴散

易感
人群

殺菌劑方案

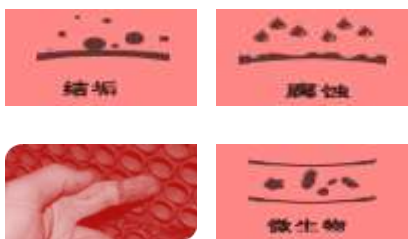
生物膜

偵測準確度

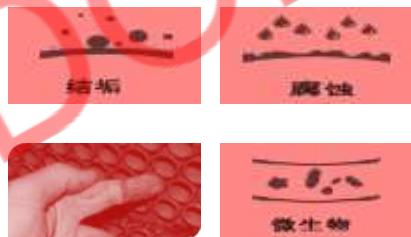
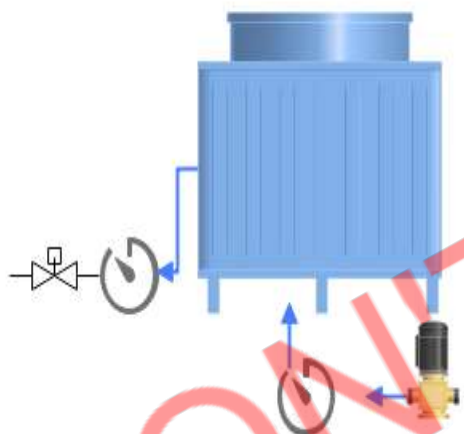
定期量測

藝康水質管理的實踐

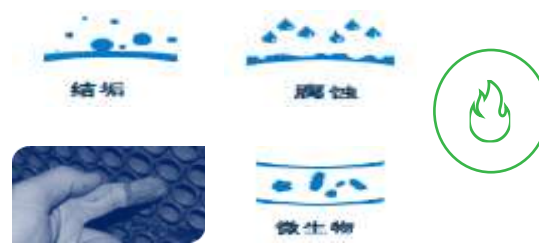
酸洗時代



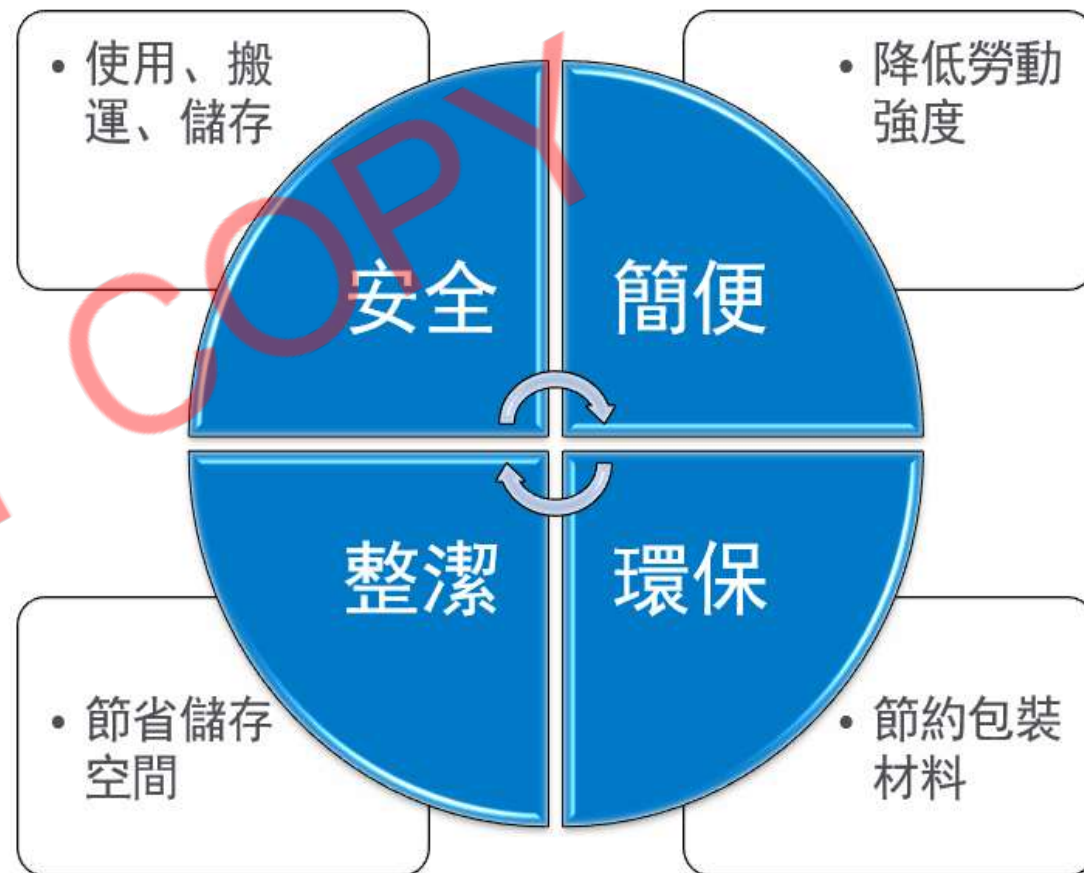
半自動加藥控制



檢測/確實/實現控制



3DT SOLID CONTROLLER應用在食品飲料廠



液態藥品轉化固態藥品控制監測方案

BEFORE



AFTER





水淨化的議題

項目 名稱	水量 (元/㎥)	化學需氧量 (COD) (元/Kg)	懸浮固體 (SS) (元/Kg)	酸鹼度 (pH) (元/㎥)
生活污水收費單價	一六.四九	六四.五四	九一.一二	-00
工業廢水收費單價	五六.四〇	七二.九五	七〇.六八	-00



藥品	用量(kg/mon)	單價	每月費用	節省
原PAC	18000	3.7	66600	
原polymer	60	125	7500	
			74100	
N-8187	700	105	73500	
N-9901	80	175	14000	
			87500	
				-13400

方案	污泥量(T/mon)	處理費(元/T)	每月費用	節省
舊方案	20	4000	80000	
Nalco方案	15	4000	60000	25%
				20000
方案	NaOH量(kg/mon)	單價(元/kg)	每月費用	節省
舊方案	2500	13	32500	
Nalco方案	0	13	0	100%
				32500

節省效益: 20,000 + 32,500 - 13,400 = 39,100 NTD/mon

環保意識問題

食品廠廢水廠營運成本問題

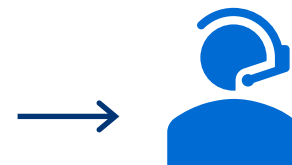
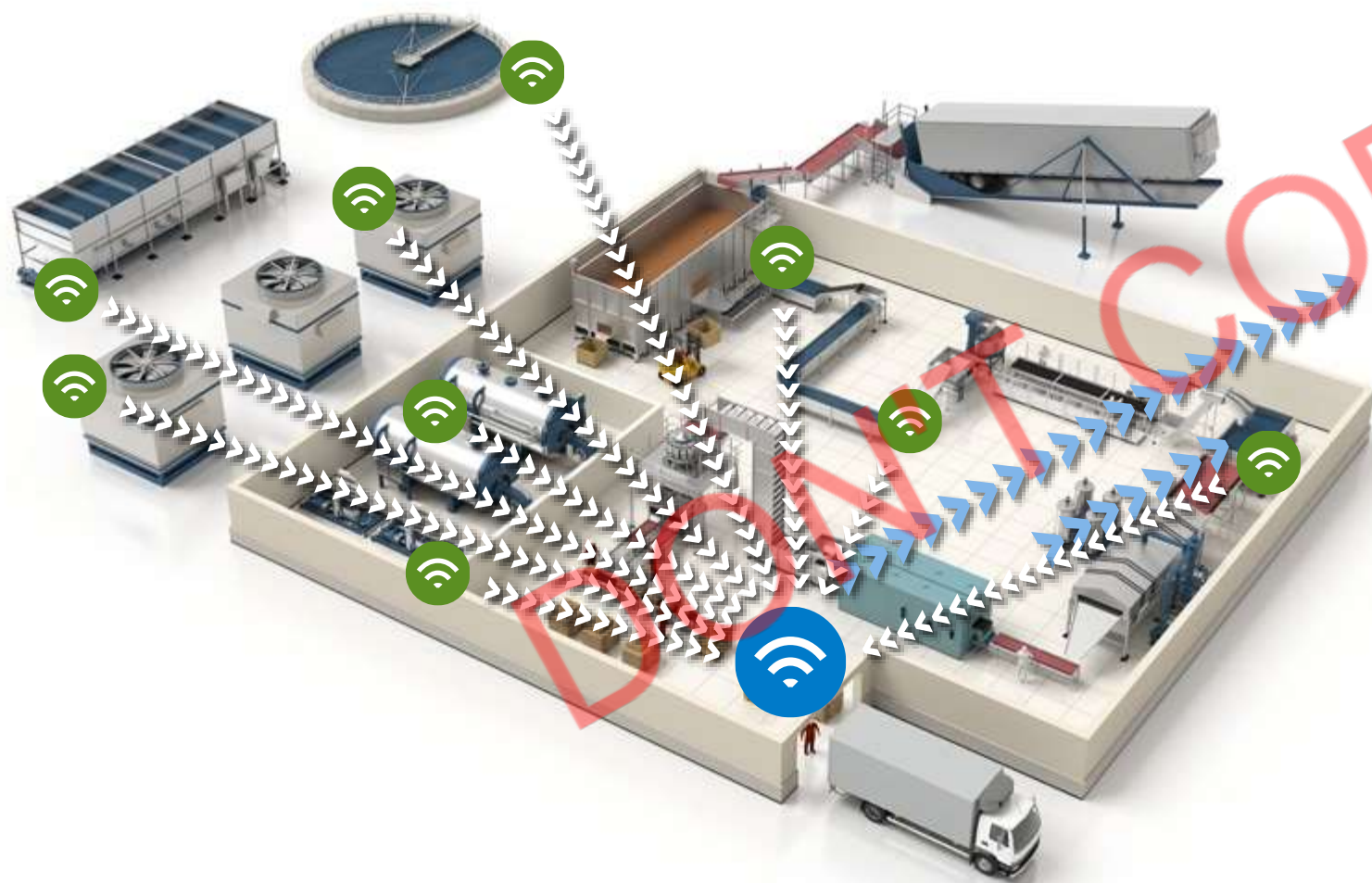
污泥量 廢棄處理費

淨化水水質 水質ok

降低營運廠成本

污泥減量

水的管理-精簡人力的水管理



服務計畫
降低人力

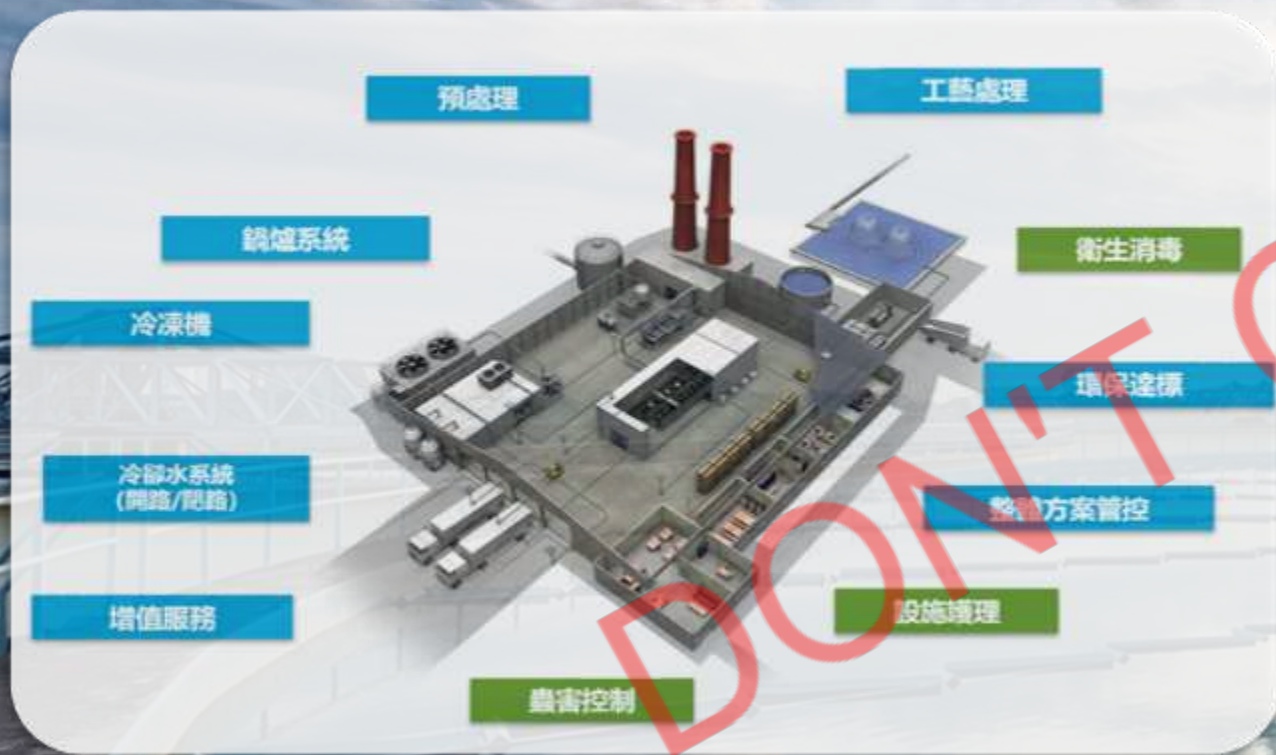


24小時監控



數據分析

實踐 ESG 目標



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