SmartCool Solution Deck

智冷科技解決方案介紹

Smart Cool Tech Limited

Agenda

- SmartCool Introduction
  - Business Overview
  - Key Competitive Advantages
  - Patents, Recognition & Awards
  - Service Model
- SmartCool Algorithm Deployment & Showcase
  - Project Screening Criteria & Deployment Process
  - Showcase
  - Sample Dashboard
  - Sample Monthly Report
- SmartCool Video Demo

WHAT ARE WE DOING

AI-Empowered Cooling Plant Management

for

Large-Scale Buildings

with

Multiple Chiller Systems

Target Project Profile:

- Number of Chillers ≥5
- Floor Area ≥ 120,000 ㎡
- Annual Chiller EC: ≥ 2 million kWh

VALUES TO PROPERTY OWNERS

Current Situation

1

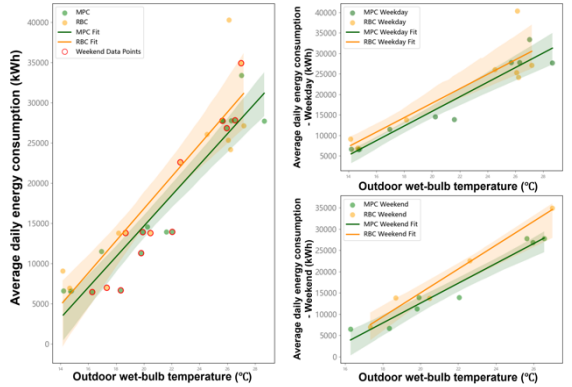
The Cooling Plant Consumes 20-40% of Total Energy Use in Modern Buildings

2

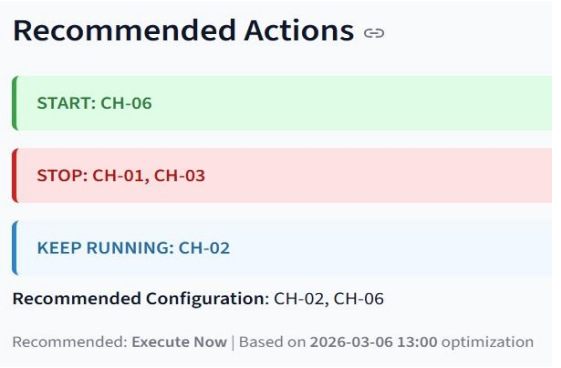
Chiller Sequencing Relies Heavily on the Operator's Experience

SmartCool Solution

Reduce Energy Consumption by 10-12%



Reduce Reliance on Operator Expertise through Real-Time, Intelligent Sequencing Strategy Recommendations



VALUES TO PROPERTY OWNERS

Current Situation

3

Manual Operations Are Still Prevalent

4

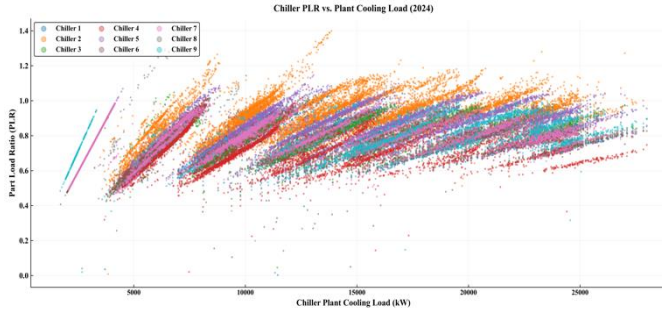
Corrective Maintenance Leads to Unexpected Shutdowns, Reduced Asset Lifespan, and Resource Strain

SmartCool Solution

Smart Operation with cutting-edge AI capabilities

- ✓ optimal operation recommendation
- ✓ natural language-based fast query
- ✓ customized dashboard

Provide real-time performance monitoring and predictive maintenance suggestions



KEY COMPETITIVE ADVANTAGES

1 NO COSTS

Software-based Solution, No Hardware Upgrades Required

Only common sensors required. Refer to the required sensor list for specifications

2 SAFETY FIRST

The solution is built on three pillars: (1) mandating end-user demand as the core constraint for sequencing optimization; (2) utilizing physics-informed neural networks to boost extrapolation accuracy; and (3) integrating explainable AI to build user trust in decision-making

3 HIGH COMPATIBILITY

Work with Existing BMS/SCADA

Minimal sensor requirements, no rip-and-replace

KEY COMPETITIVE ADVANTAGES

4 FREE TRIAL - PAY AFTER SAVINGS VERIFIED

Clients pay only after energy savings are verified

Zero financial risk to start

5 FAST DEPLOYMENT - WITHIN 1 WEEKS

Semantic Model Informed Deployment

No service interruption during deployment, with fast visible results

For Property Owners:

“ **Zero Disruption to Daily Building Operations**

Deliver Substantial Energy and Cost Savings

Enhance Operational Intelligence and System Reliability ”

The Reasons Clients Say YES

PROVEN CAPABILITIES

Patents

CN118882286A

Chiller Operation Sequence Optimizing Method and System, Storage Medium and Product

IP.PA.12453.US.PRV

CN - 202511798969.2 (Filed)

HK – Approved for Filing

BuildingGPT: Query Semantic Building Data Using Large Language Models and Vector-Graph Retrieval-Augmented Generation

IP.PA.12373.US.PRV

CN - 202511426158.X (Filed)

HK – Approved for Filing

Chiller Sequencing Optimization Based on Data-Driven Model Predictive Control with Dynamic Programming Method

基於數據驅動模型預測控製和
動態規劃方法的
冷水機組運行順序優化

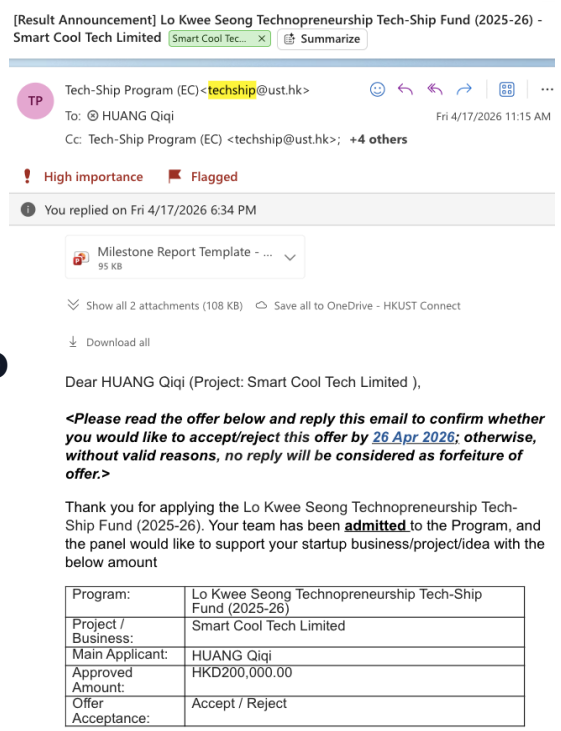
PROVEN CAPABILITIES

Recognition & Awards

HK$200k FUND

Lo Kwee Seong Technopreneurship Tech-Ship Fund

Received a HK$200,000 non-equity, non-dilutive funding support (5 awards annually), to drive smart chiller & carbon reduction deployment.



[Result Announcement] Lo Kwee Seong Technopreneurship Tech-Ship Fund (2025-26) - Smart Cool Tech Limited Smart Cool Tec... Summarize

TP Tech-Ship Program (EC)<techship@ust.hk>

To: HUANG Qiqi Fri 4/17/2026 11:15 AM

Cc: Tech-Ship Program (EC) <techship@ust.hk>; +4 others

High importance Flagged

You replied on Fri 4/17/2026 6:34 PM

Milestone Report Template - ... 95 KB

Show all 2 attachments (108 KB) Save all to OneDrive - HKUST Connect

Download all

Dear HUANG Qiqi (Project: Smart Cool Tech Limited),

<Please read the offer below and reply this email to confirm whether you would like to accept/reject this offer by 26 Apr 2026; otherwise, without valid reasons, no reply will be considered as forfeiture of offer.>

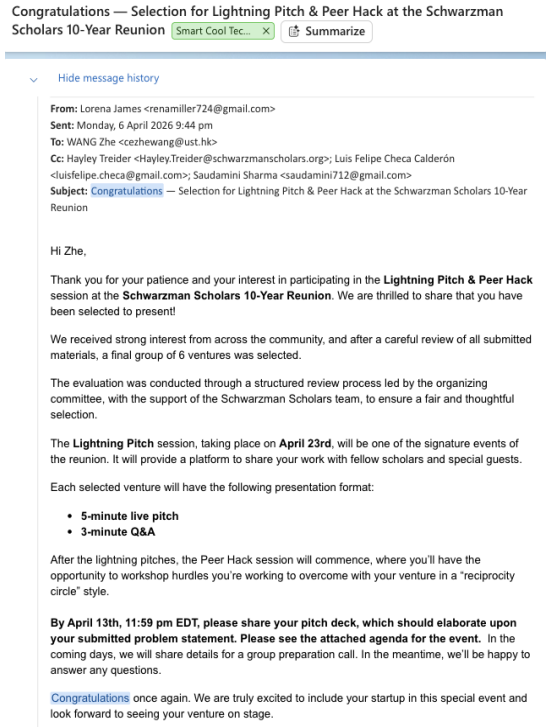
Thank you for applying the Lo Kwee Seong Technopreneurship Tech-Ship Fund (2025-26). Your team has been **admitted** to the Program, and the panel would like to support your startup business/project/idea with the below amount

Program:	Lo Kwee Seong Technopreneurship Tech-Ship Fund (2025-26)
Project / Business:	Smart Cool Tech Limited
Main Applicant:	HUANG Qiqi
Approved Amount:	HKD200,000.00
Offer Acceptance:	Accept / Reject

GLOBAL TOP 6 VENTURE

Lightning Pitch & Peer Hack (Schwarzman Scholars)

Selected as one of the Top 6 global projects (across all fields) in the Lightning Pitch & Peer Hack held at the Schwarzman Scholars 10th Anniversary Reunion.



Congratulations — Selection for Lightning Pitch & Peer Hack at the Schwarzman Scholars 10-Year Reunion Smart Cool Tec... Summarize

Hide message history

From: Lorena James <renamiller724@gmail.com>
Sent: Monday, 6 April 2026 9:44 pm
To: WANG Zhe <cezhewang@ust.hk>
Cc: Hayley Treider <Hayley.Treider@schwarzmanscholars.org>; Luis Felipe Checa Calderón <luisfelipe.checa@gmail.com>; Saudamini Sharma <saudamini712@gmail.com>
Subject: Congratulations — Selection for Lightning Pitch & Peer Hack at the Schwarzman Scholars 10-Year Reunion

Hi Zhe,

Thank you for your patience and your interest in participating in the **Lightning Pitch & Peer Hack** session at the **Schwarzman Scholars 10-Year Reunion**. We are thrilled to share that you have been selected to present!

We received strong interest from across the community, and after a careful review of all submitted materials, a final group of 6 ventures was selected.

The evaluation was conducted through a structured review process led by the organizing committee, with the support of the Schwarzman Scholars team, to ensure a fair and thoughtful selection.

The **Lightning Pitch** session, taking place on **April 23rd**, will be one of the signature events of the reunion. It will provide a platform to share your work with fellow scholars and special guests.

Each selected venture will have the following presentation format:

- **5-minute live pitch**
- **3-minute Q&A**

After the lightning pitches, the Peer Hack session will commence, where you'll have the opportunity to workshop hurdles you're working to overcome with your venture in a "reciprocity circle" style.

By April 13th, 11:59 pm EDT, please share your pitch deck, which should elaborate upon your submitted problem statement. Please see the attached agenda for the event. In the coming days, we will share details for a group preparation call. In the meantime, we'll be happy to answer any questions.

Congratulations once again. We are truly excited to include your startup in this special event and look forward to seeing your venture on stage.

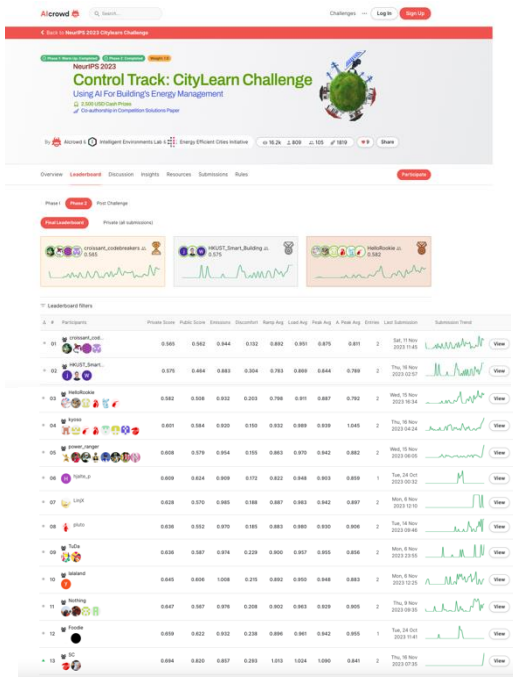
PROVEN CAPABILITIES

Recognition & Awards

2ND PLACE WINNER

2023 NeurIPS CityLearn Challenge

NeurIPS is the world's leading AI research conference. The CityLearn Challenge benchmarks building energy optimization solutions globally.



GOLD AWARD

Global AI Challenge for Building E&M Facilities

Organized by Hong Kong's EMSD with Tencent and Huawei — the most authoritative AI competition focused on building E&M facilities in Greater China.

PROVEN CAPABILITIES

Recognition & Awards

SECOND PRIZE

Hong Kong University Student Innovation and Entrepreneurship Competition

Received a second prize at the entrepreneurship category (startup).

SILVER AWARD

2026 Hong Kong Techathon+

Awarded a silver award in the Sustainability & ESG track (student group) at Hong Kong Techathon+ 2026. Also received Techathon + x HKSTP Co-Ideation Programme Conditional Offer.

PROVEN CAPABILITIES

Core Team from HKUST + Tsinghua

Zhe (Walter) WANG

Associate Professor

Department of Civil and Environmental Engineering,
The Hong Kong University of Science and Technology

Achievements

Schwarzman Scholar
World's Top 2% Scientists by Stanford University & Elsevier
Member of Technical Committee of Buildings Department, HKSAR
Awardee of National Science Fund for Excellent Young Scholars
Associate Director of HKUST Smart City Institute

Borong LIN

Professor and Deputy Dean

School of Architecture, Tsinghua University

Achievements

Director of the Key Laboratory of Eco Planning & Green Building
Chang Jiang Scholar Distinguished Professor
National Ten-Thousand-Plan Leaders (First Batch)
Member of the National Carbon Neutrality Expert Committee
Awardee of National Science Fund for Distinguished Young Scholars

PROVEN CAPABILITIES

Core Team from HKUST + Tsinghua

Shuhao LI

Co-founder & CEO
HKUST Mphil 26’

Build the Foundation

Architect green AI cloud platforms, core models, and scalable deployment infrastructure

Siqi LI

Co-founder & CPO
HKUST PhD 26’

Empower the Ecosystem

Adapt and optimize AI models for partners, navigating the technical path to ESG incentives

Mingchen LI

Co-founder & CTO
HKUST PhD 26’

Connect the Intelligence

Build semantic-model–driven LLM interaction and scalable deployment frameworks

Tippi HUANG

Co-founder & CMO
HKUST PhD 27’

Translate Tech into Impact

Bridge technical capabilities to green finance, policy, and strategic narratives for scale

SERVICE MODEL

Energy Performance Contracting (EPC) Mode

No Upfront Cost, No Risk, Shared Rewards

Step 1 – Free Simulation Analysis

Proceed to the next step only if the projected electricity cost saving exceeds **HK$ 300,000**

Step 2 – Free One-Year Pilot Test

Conduct a one-year on-site test to validate the actual energy-saving rate

Step 3 – EPC Mode / Subscription

Starting from Year 2, we will charge ***50%*** of the verified cost savings as service fee

ALGORITHM DEPLOYMENT

Project Screening Criteria

A. Building Type

- Commercial complexes
- Office buildings
- Hospitals
- Airports, high-speed railway stations
- Industrial parks / campuses
- Hotels
- District cooling systems

Large public buildings with centralized cooling systems

B. Building Scale

- Number of chillers:
  ≥5 units
- Annual chiller electricity consumption:
  ≥2,000,000 kWh
- Recommended building area:
  ≥120,000 ㎡

Large-scale systems with multiple chillers

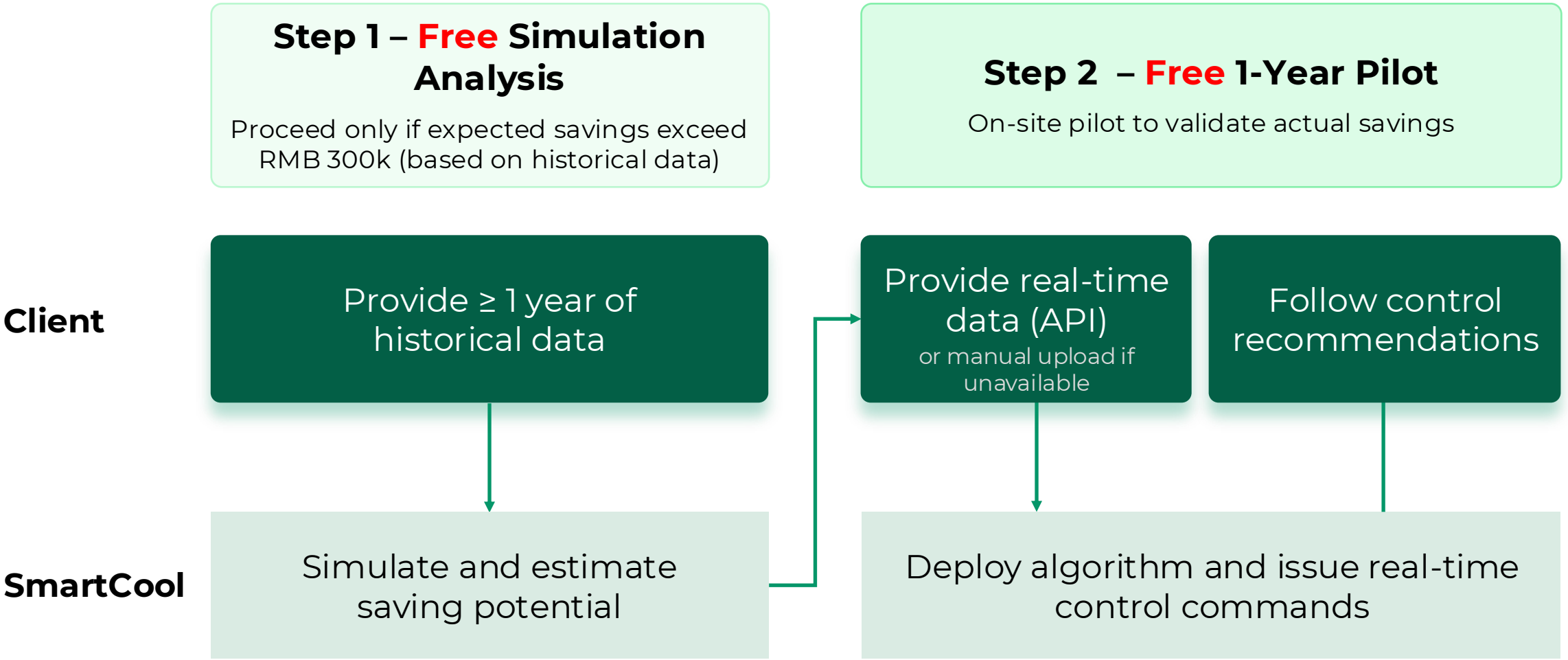
C. Data Requirements

- At least one year of historical data
- Sensor points include
  - Chilled water supply temperature
  - Chilled water flow rate*
  - Condenser water flow rate*
  - Cooling water return temperature
  - Chiller power consumption
  - Cooling tower and pump power consumption

*** If unavailable, flow rates can be estimated using pump speed and rated flow**

ALGORITHM DEPLOYMENT

Deployment Process



SHOWCASE

Project:
Ruihong Hall of the Sun (Shanghai)

OVERALL ENERGY SAVINGS

11.52%

Reduction in total chiller plant energy consumption

11.16% Working Days

13.22% Non-Working Days

384 MWh
ANNUAL ENERGY SAVED

HK$324,000
ANNUAL COST REDUCED

204.5 tCO_2e
EMISSION REDUCED

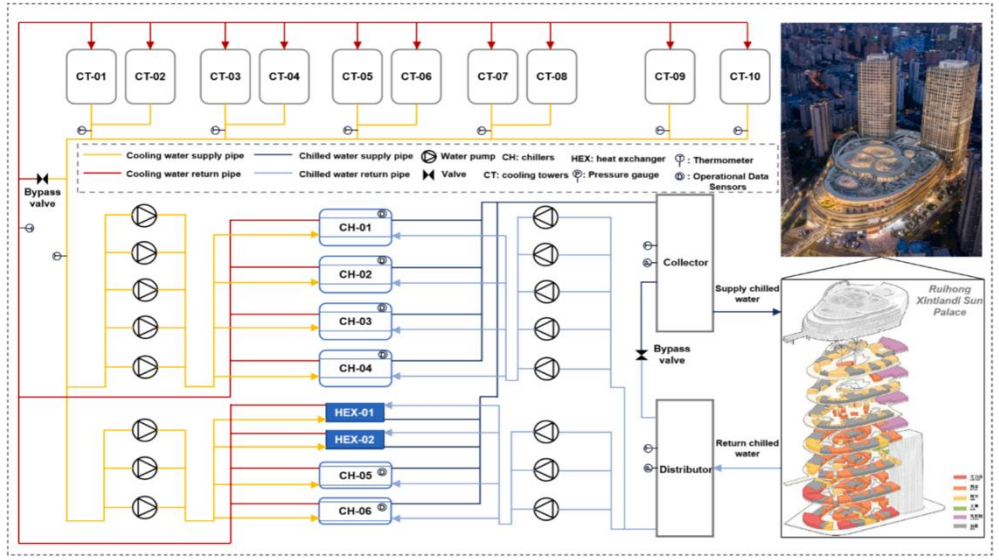
Zero
EQUIPMENT FAILED

– Basic Information

- Large commercial complex, total floor area: 180,000 sq.m.

– HVAC System

- Chiller plant includes: 4 centrifugal chillers (6,681 kW each) and 2 screw chillers (1,561 kW each)
- Annual electricity consumption: 3.1 million kWh



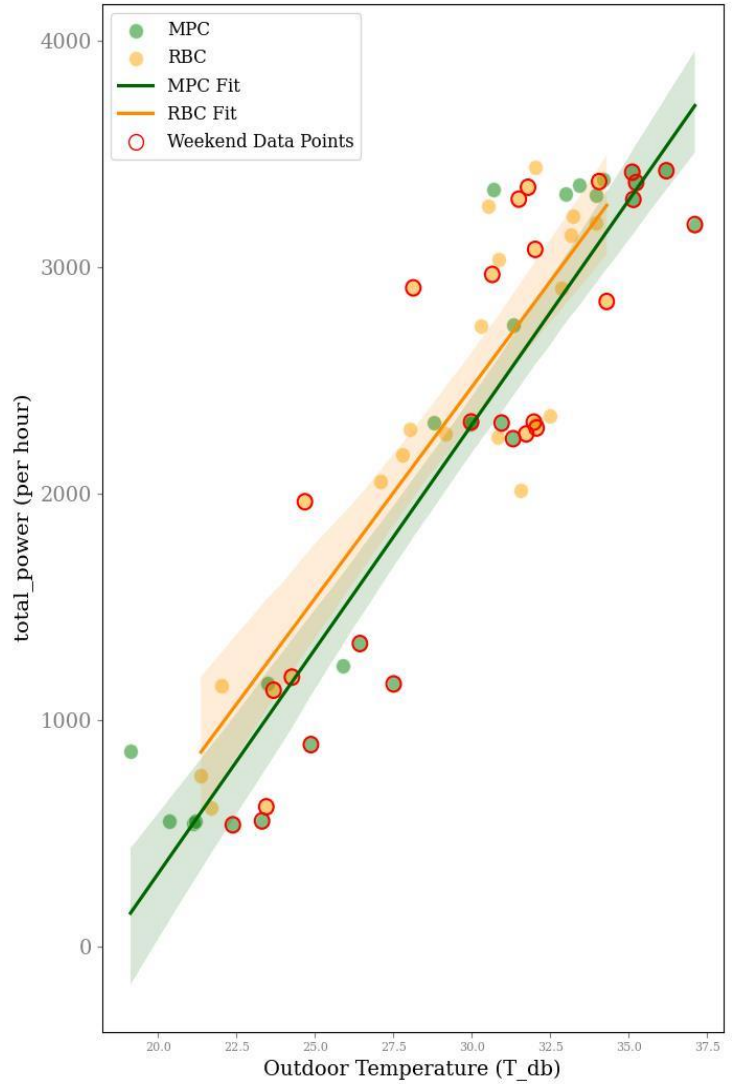
SHOWCASE

Project:
Ruihong Hall of the Sun (Shanghai)

- **Testing Period**
  - Jul - Oct 2024
  - Alternating operation: MPC vs. RBC (baseline)
- **Measured Results**
  - Annual energy savings: 384,000 kWh
  - Energy saving rate: **11.52%**

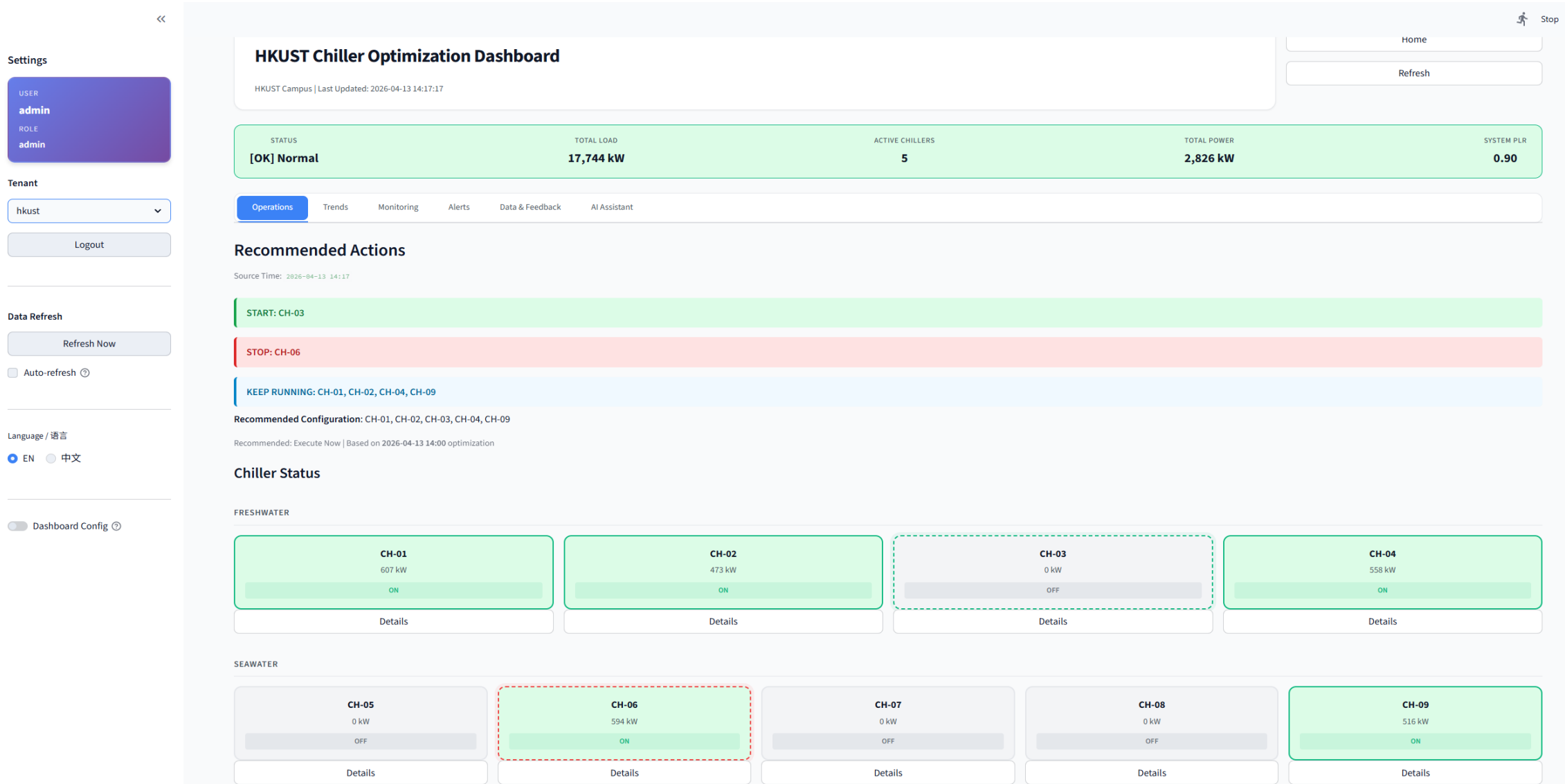
September 2024						
Mon	Tue	Wed	Thu	Fri	Sat	Sun
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
October 2024						
Mon	Tue	Wed	Thu	Fri	Sat	Sun
30	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

MPC RBC



	Avg. Workday Energy (kWh)	Avg. Non-workday Energy (kWh)	Avg. Daily Energy (kWh)
Baseline (RBC)	28,500	28,800	28,600
SmartCool (MPC)	25,100	25,900	25,400
Energy Saving Rate	11.16%	13.22%	11.52%

SAMPLE DASHBOARD



SAMPLE MONTHLY REPORT

Contents

Sections in this report. Entries are clickable in the digital PDF.

Overview

System-level performance for April 2026 (through Apr 23). The three headline metrics cross-validate: total cooling ÷ total energy ≈ system COP.

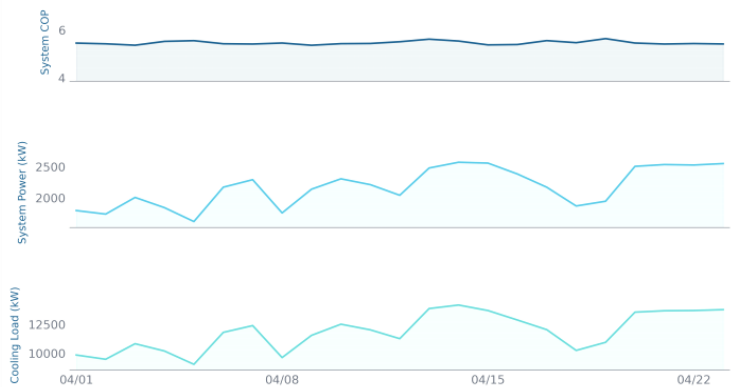
1,186,373 kWh
Total Energy
↑ 64.8% vs previous month

5.46 COP
System Avg COP
↓ 1.7% vs previous month

6,480.2 MWh · cold
Total Cooling
↑ 62.0% vs previous month

* The comparison vs previous month is computed on a **daily-average** basis to neutralize month-length differences (23 days this month vs 31 days last month). COP is an intensity metric and is unaffected by month length.

System Efficiency Trend



Source: system_level_data · 2026-04-01 — 2026-04-23

Daily Avg System COP	Daily Avg Power	Daily Avg Cooling Load
5.46	2171 kW	11858 kW

Fleet Overview

Monthly performance for every chiller plus workload-normalized ACPV scores, ordered by chiller ID.

Chiller	Runtime (h)	Energy (kWh)	Cooling (kWh)	Avg COP	ACPV vs Baseline	COP Rank	Coverage
CH-01	428	242,266	1,502,987	6.20	+1.53	4/8	99.0%
CH-02	458	200,021	1,280,172	6.40	+1.56	1/8	99.0%
CH-03	224	122,606	754,203	6.15	+0.99	5/8	99.0%
CH-04	228	122,397	779,693	6.37	+2.09	3/8	99.0%
CH-05	249	129,997	789,304	6.07	+1.48	6/8	99.0%
CH-06	33	18,607	107,508	5.78	+2.16	8/8	99.0%
CH-07	139	79,147	467,273	5.90	+1.36	7/8	99.0%
CH-09	247	124,116	791,393	6.38	+2.72	2/8	99.0%

ACPV window: 2026-04-01 — 2026-04-30 (1-month rolling), baseline: 2025-01-01 — 2025-12-31

Diagnosis & Recommendations

Predictive-maintenance pointers based on this month's ACPV, COP rank and data completeness.

Watch CH-06: bottom of the fleet on monthly COP (8/8, average 5.78); 10% lower than top-ranked CH-02 (6.40). Prioritise an operational inspection and preventive maintenance for this unit (heat transfer, oil circuit, sensor checks).

The remaining chillers held ACPV above baseline; no targeted intervention is required this month.

This panel automatically aggregates per-chiller ACPV, COP rank and data completeness — the early-warning signals an engineer would normally cover during routine inspection.

ACPV (Asset Comparable Performance Value) is a workload-normalized score benchmarked against the annual healthy baseline. Positive Δ means this month outperforms baseline; ⚠ flags chillers whose ACPV fell below the annual baseline this month and warrant a closer look.

SAMPLE MONTHLY REPORT

04 · ALGORITHM SAVINGS

Algorithm Savings Performance

System-level daily comparison: SmartCool AI control during 2026-04-09 → 2026-04-19 vs baseline control during 2025-05-12 → 2025-05-30; 2026-04-20 → 2026-04-26.

Energy Saving Rate	COP Improvement	Daily Energy Savings
+2.82%	**+2.55%**	**+1,630** kWh/day
Relative drop in daily mean power under AI control vs baseline.	Relative gain in daily mean system COP under AI control vs baseline.	Absolute kWh saved per day on average under AI control vs baseline.

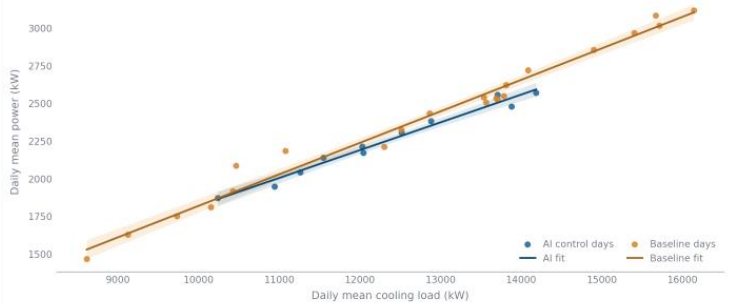
AI Control Window 2026-04-09 → 2026-04-19 · 11 days

Baseline Window 2025-05-12 → 2025-05-30; 2026-04-20 → 2026-04-26 · 22 days

Baseline is selected from historical operation to match the AI window's daily mean cooling load. When intermittent test windows exist, we compare alternating weeks to keep conditions comparable. The baseline may therefore come from a different season.

Scope: Energy-saving rate, COP improvement, and daily kWh savings are computed only on the overlapping daily mean cooling-load range between AI and baseline fitted curves, not a naive calendar-day average.

AI Control vs Baseline (system-level daily load–power)



Windows follow tenant configuration and may extend beyond the report month when tests cross month boundaries.

05 · CHILLER DETAIL CH-01

Chiller Detail • CH-01

April 2026 (through Apr 23) • Monthly operating profile and performance verdict for CH-01.

242,266 kWh	1,502,987 kWh	6.20
Energy This Month —	Cooling This Month —	Avg COP

Runtime Hours	Start/Stop Cycles	Avg PLR	CHW ΔT	CDW ΔT	Data Coverage
428 h	13	0.83	5.7 °C	6.7 °C	99.0%

Fleet COP Rank **4/8** Raw average-COP ordering across the fleet this month. 1 = highest observed COP.

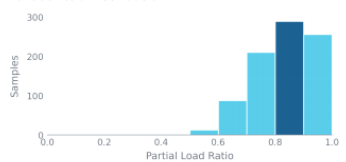
ACPV Performance Tracking

Workload-normalized benchmark against the annual healthy baseline (not month-over-month; see methodology).

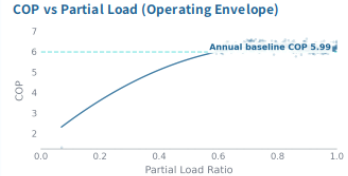
Current ACPV	Baseline ACPV	Δ vs Baseline
7.51	5.99	+1.53

Shared-Workload Coverage 18%

Partial Load Distribution



COP vs Partial Load (Operating Envelope)



AI INSIGHT

Observation This unit's average COP dropped 5.6% month-over-month to 6.20, while its ACPV score (7.51) was 25% above baseline, although this ACPV is based on limited comparable data (18% weight).

BuildingGPT · CROSS-SECTION SYNTHESIS

Executive Summary

Overall verdict, key findings, and priority actions for next month.

OVERALL JUDGMENT

System COP declined 1.65 % to 5.46 while daily-average cooling demand rose 62 % and energy use 65 %, a modest efficiency loss given the load surge. The key driver is the transition to summer loads, with chilled-water supply temperature already near its danger threshold (peak 7.65 °C). Confidence in energy and COP trends is high (99 % data coverage), but ACPV-based efficiency assessments are not yet reliable—none of the eight chillers have sufficient comparable data.

KEY FINDINGS

1. Daily-average cooling demand rose 62 % and energy consumption 65 %, yet system COP dipped only 1.65 % to 5.46, showing the plant absorbed a major load increase with minimal efficiency loss.
2. Chiller CH-06 had the lowest fleet COP (5.778), 9.73 % below the best unit (CH-02 at 6.40), and operated only 33 runtime hours, suggesting possible sequencing or maintenance issues.
3. Chilled-water supply temperature averaged a daily maximum of 6.67 °C with a peak of 7.65 °C, indicating limited operational headroom as summer loads approach.

NEXT MONTH · ACTIONS

1. Review chiller sequencing and maintenance schedules ahead of summer; prioritize CH-06 for inspection given its low COP and short runtime.
2. Monitor daily chilled-water supply temperature; if the peak approaches 7.65 °C under rising load, adjust operational strategy to preserve headroom.
3. If system COP continues to decline month-over-month while cooling demand stays elevated, audit load distribution across chillers and verify adequate duty rotation.

Generated by SmartCool AI; anchored to numbers appearing in this report.

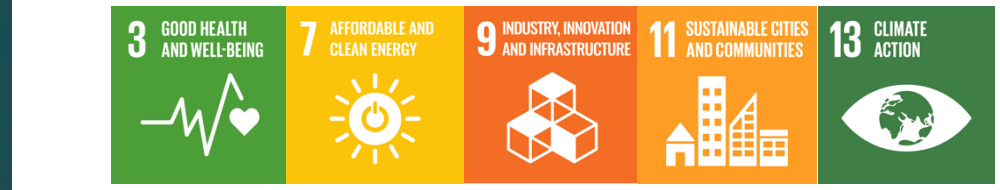
SmartCool Pitch Video

https://youtu.be/7lLucDBIHXI?si=XnTJYLO-77pVtNvR

Tech for Good, Cool for Future

— Buildings and Planet Breathe Together

Smart Cool Tech Limited



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