

GreenFlow Building Performance & Semantic Report

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Building: Nordic LCA Office | Location: Hanoi-Noi.Bai.Intl.AP | Generated: 2026-07-03 17:35

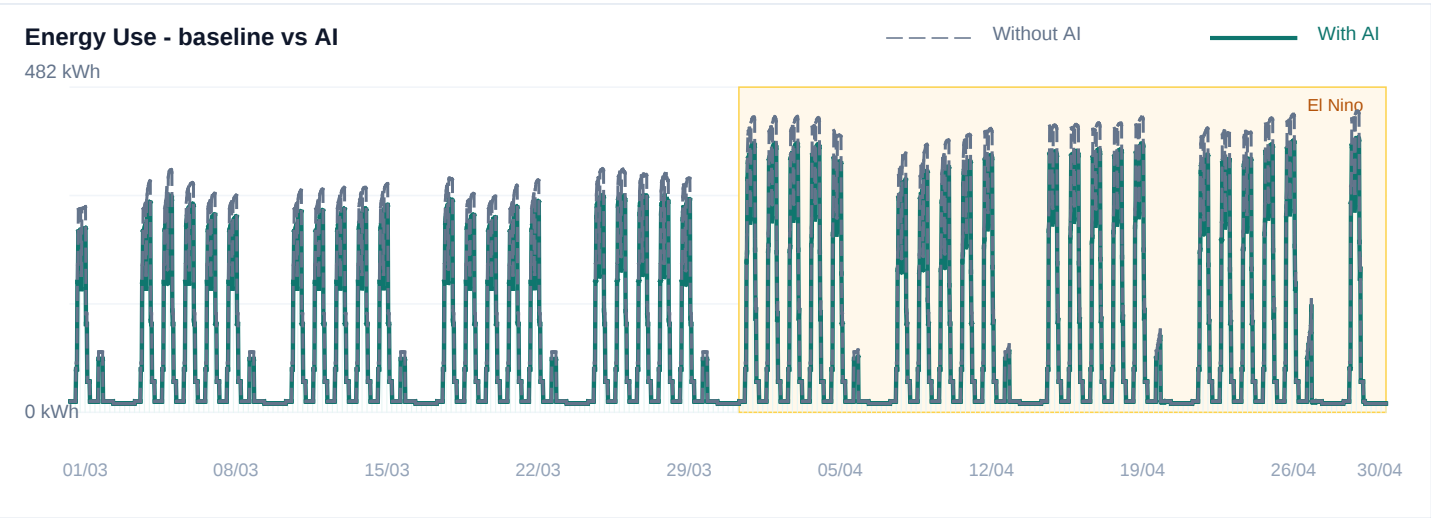
Executive summary

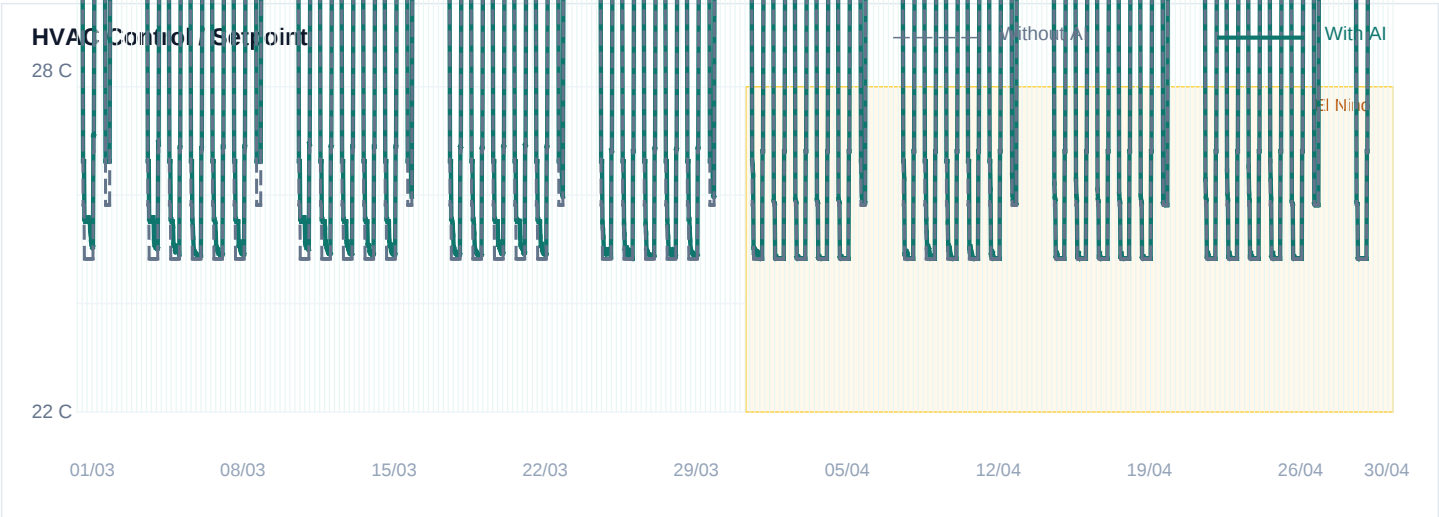
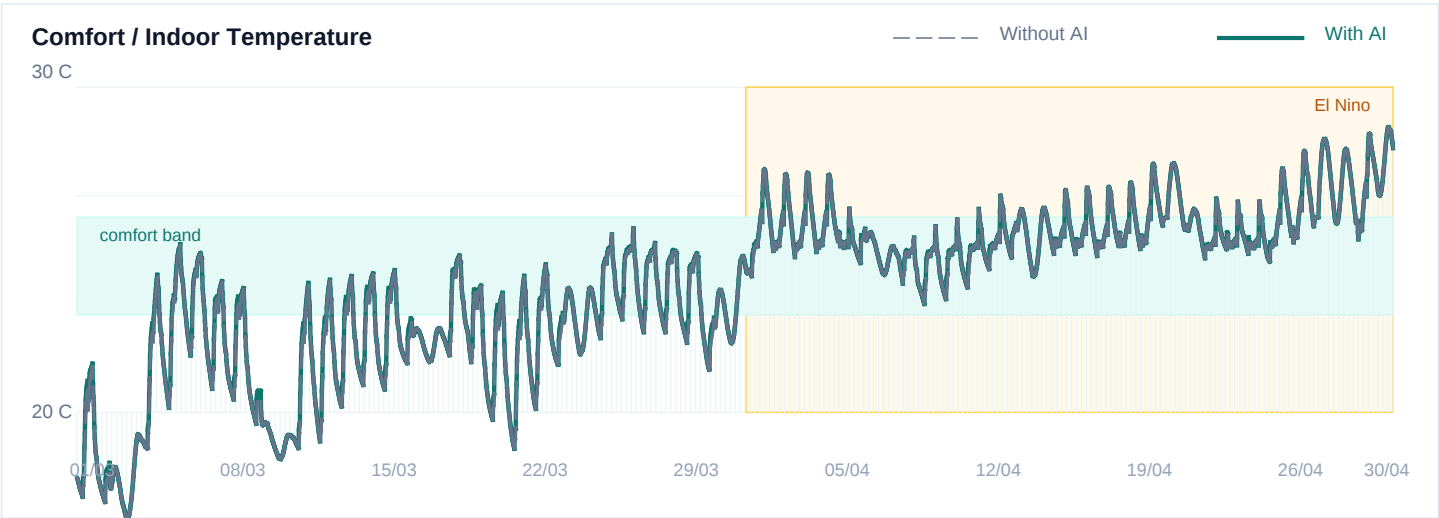
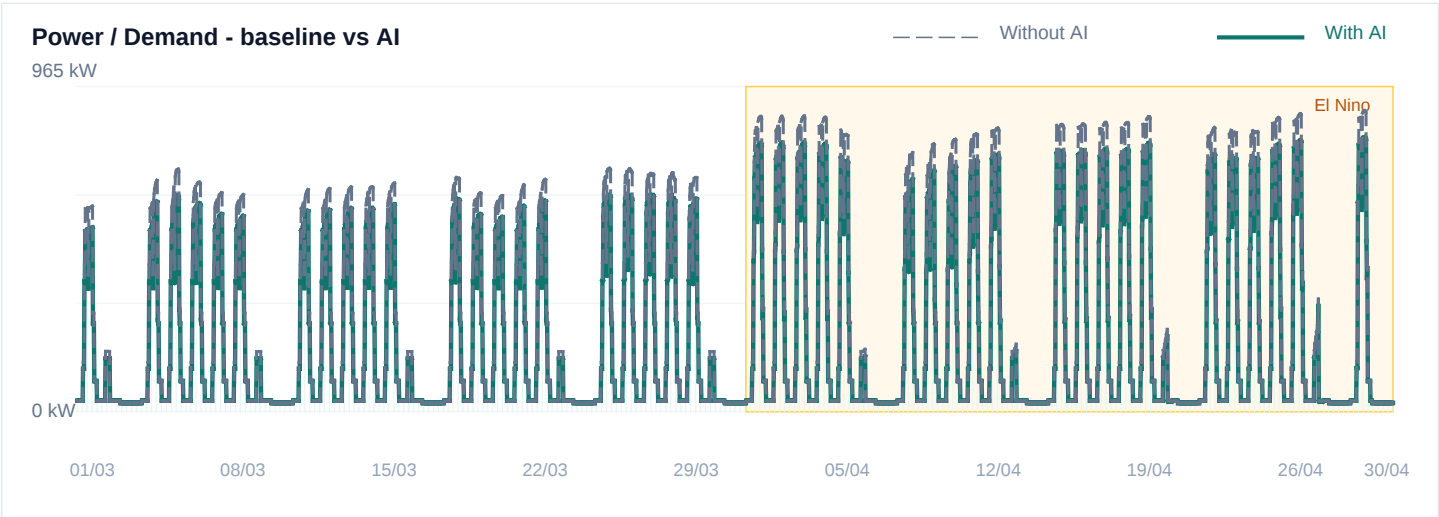
- Overall Building Performance Index is 71/100 (Watch) against the latest replay anchor: 2024-04-17T15:00:00+07:00.
- Current building load is 855.7 kW with 3,438 occupants represented in telemetry.
- The report covers 308 thermal zones, 44 devices, and semantic mappings from the current backend state.
- Priority exceptions: 286 abnormal findings and 602 semantic/data-quality gaps require review.

Validation experiment charts

These five charts mirror tab 4 (Validation Experiment) for 2024-03-01 to 2024-04-30, using predictive MPC replay cache predictive_replay_elnino_2024_mar_apr_h8_top4_v2_policy_aware_d1e4acb43acb.

Improvement indicator	Baseline	With AI	Improvement
Energy use	350,584.4 kWh	319,671 kWh	30,913.3 kWh (8.8%) saved
Operating cost	644,724,712 VND	587,874,969 VND	56,849,647 VND avoided
Average peak-demand	561.4 kW	508.3 kW	53.1 kW lower
CO2 emissions	237,205.4 kg	216,289.4 kg	20,916 kg avoided
Added comfort violation	207,570 min	0 min added	207,570 min total AI violation
End-use saving split	-	-	Lighting 30,566 kWh; HVAC 363.4 kWh





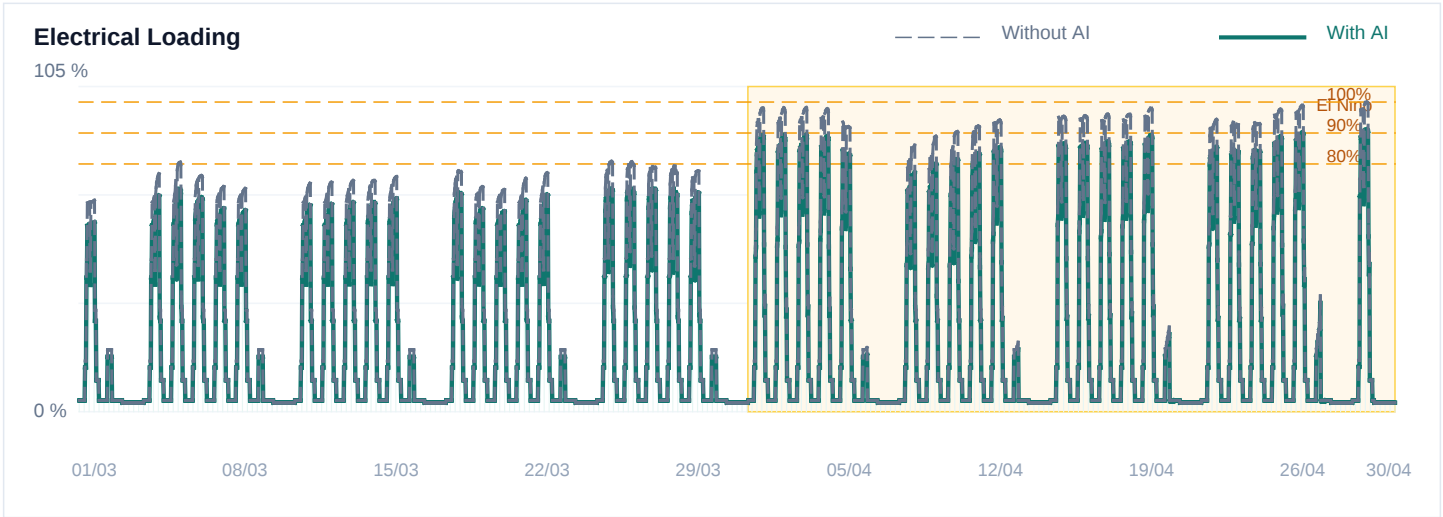


Chart-level improvement summary

Chart	Baseline summary	With AI summary	Improvement signal
Energy Use	350,584.6 kWh	319,671.4 kWh	30,913.2 kWh; lower total consumption
Power / Demand	561.4 kW	508.3 kW	53.1 kW; lower average daily peak
Comfort / Indoor Temperature	23.8 C	23.9 C	0 C; comfort band preserved
HVAC Control / Setpoint	28 C	28.1 C	-0.1 C; MPC setpoint shift applied
Electrical Loading	100%	91.1%	8.9%; lower normalized stress

Report scope and asset profile

Item	Value
Building	Nordic LCA Office
Location	Hanoi-Noi.Bai.Intl.AP
Generated	2026-07-03 17:35
Floors	10
Thermal zones	308
Devices	44
Gross modeled area	15,036 m2
Source dataset	elnino_2024_mar_apr

Building Performance Index scorecard

Dimension	Score	Target	Status	Backend evidence
Overall score	71	80	Watch	286 findings; 602 metadata gaps
Air quality	53	80	Critical	136 >1000ppm · 0 elevated CO?

Energy / demand	40	85	Critical	288/288 zones in peak-demand risk
Thermal comfort	84	82	Good	8 high · 77 watch / 288 zones
Equipment health	100	85	Good	0 device · 0 sensor zones / 288 zones

Operational snapshot

Metric	Current value	Why it matters
Total demand	855.7 kW	Real-time electrical load used by the demand score.
Calendar-day energy	8,839.8 kWh	Day-to-date consumption from counted zones.
Operating cost	20,709,467 VND	Day-to-date energy cost estimate.
Occupancy	3,438 people	People load used to interpret comfort and IAQ risk.
Comfort high risk	8 zones	Zones outside acceptable comfort conditions.
Peak-demand risk	288 zones	Zones contributing to demand-window exposure.

Priority findings and risk register

1. comfort_risk_high (high)

- Evidence: Basement · ELECT 0302 · 63.8 m² at 27.49degC exceeds comfort threshold while occupied
- Recommended action: Check setpoint, zone load, and terminal-unit response for affected zones.

2. comfort_risk_high (high)

- Evidence: Basement · ELECT 0303 · 18.4 m² at 27.84degC exceeds comfort threshold while occupied
- Recommended action: Check setpoint, zone load, and terminal-unit response for affected zones.

3. comfort_risk_high (high)

- Evidence: Basement · ELECT 0304 · 19.5 m² at 27.66degC exceeds comfort threshold while occupied
- Recommended action: Check setpoint, zone load, and terminal-unit response for affected zones.

4. comfort_risk_high (high)

- Evidence: Basement · HEATING 0301 · 27.2 m² at 27.92degC exceeds comfort threshold while occupied
- Recommended action: Check setpoint, zone load, and terminal-unit response for affected zones.

5. comfort_risk_high (high)

- Evidence: Level 01 · UTILITY ROOM 1404 · 11.5 m² at 27.14degC exceeds comfort threshold while occupied
- Recommended action: Check setpoint, zone load, and terminal-unit response for affected zones.

6. comfort_risk_high (high)

- Evidence: Level 05 · ELECT 5301 · 24.2 m² at 27.99degC exceeds comfort threshold while occupied
- Recommended action: Check setpoint, zone load, and terminal-unit response for affected zones.

7. comfort_risk_high (high)

- Evidence: Level 05 · VENT 500 · 37.0 m² at 27.92degC exceeds comfort threshold while occupied
- Recommended action: Check setpoint, zone load, and terminal-unit response for affected zones.

8. comfort_risk_high (high)

- Evidence: Level 05 · VENT 510 · 883 m² at 27.42degC exceeds comfort threshold while occupied
- Recommended action: Check setpoint, zone load, and terminal-unit response for affected zones.

9. zone_unmapped_devices (info)

- Evidence: Basement · BATHROOM / ACCESSIBLE 0126 · 6.6 m² has no device mapping in the semantic graph
- Recommended action: Complete zone-device mapping before using this point for automated control.

10. zone_unmapped_devices (info)

- Evidence: Basement · BATHROOM / ACCESSIBLE 0234 · 6.5 m² has no device mapping in the semantic graph
- Recommended action: Complete zone-device mapping before using this point for automated control.

11. zone_unmapped_devices (info)

- Evidence: Basement · BREAK ROOM 012 · 16.4 m² has no device mapping in the semantic graph
- Recommended action: Complete zone-device mapping before using this point for automated control.

12. zone_unmapped_devices (info)

- Evidence: Basement · BREAK ROOM 023 · 10.5 m² has no device mapping in the semantic graph
- Recommended action: Complete zone-device mapping before using this point for automated control.

Recommended action plan

Workstream	Action	Owner	Target window
Demand management	Run peak-demand mitigation for high-risk zones before the next peak window.	Facility energy lead	Today
Indoor air quality	Review CO2 excursions, ventilation schedule, and economizer/outside-air availability.	BMS operator	24 hours
Data quality	Close semantic mapping gaps so controls and reports use traceable source points.	Digital twin owner	This week

Semantic coverage and data quality

Data domain	Coverage / issue	Interpretation
Zone-device mapping	4.5% mapped	Share of zones with at least one mapped device relation.
Missing metadata	602 gaps	Items that reduce traceability or automation confidence.
Open findings	286 findings	Active exceptions generated from semantic graph and telemetry.

Top metadata gaps:

- zone_without_devices - Level 01 · FREEZER 1104 · 3.6 m² has no mapped devices
- zone_without_devices - Level 02 · STORE 2210 · 11.0 m² has no mapped devices
- zone_without_devices - Level 05 · RECREATION 520 · 181 m² has no mapped devices
- zone_without_devices - Level 03 · MEETING 3304 · 17.5 m² has no mapped devices
- zone_without_devices - Level 04 · OPEN OFFICE 440 · 118 m² has no mapped devices
- zone_without_devices - Level 04 · CLEANING 4103 · 2.6 m² has no mapped devices
- zone_without_devices - Level 04 · CLEANING 4403 · 2.6 m² has no mapped devices
- zone_without_devices - Level 04 · TOILET 4201 · 7.1 m² has no mapped devices

Methodology and data provenance

- Scores are generated from live backend tools, not frontend mock data.
- BPI scoring uses transparent 0-100 sub-scores: air quality, energy/demand, thermal comfort, and equipment reliability.
- Status bands are Critical 0-59, Watch 60-79, and Good 80+; dimension targets match the dashboard cards.
- Energy and comfort values come from counted telemetry zones at the replay anchor; semantic coverage comes from the zone-device graph.
- This export is an operations report for triage and decision support; it is not a third-party audit certificate.

Appendix A - Zone snapshot, top load zones

Zone	Type	Area m2	Occupancy	Temp C	Load kW	Comfort
Level 02 · OFFICE TSTO1 · 1,145 m ²	workspace	1,145	235	25	62.1	normal
Level 03 · OFFICE TSTO6 · 876 m ²	workspace	876	185	25	48.8	normal
Level 04 · OFFICE TSTO10 · 876 m ²	workspace	876	185	25	48.6	normal
Level 02 · OFFICE TSTO2 · 876 m ²	workspace	876	180	25	47.5	normal
Level 03 · OFFICE TSTO5 · 644 m ²	workspace	644	137	25	35.9	normal
Level 04 · OFFICE TSTO9 · 644 m ²	workspace	644	136	25	35.8	normal
Level 01 · BUSINESS SPACE LIIK1 · 418 m ²	workspace	418	130	25	33.2	normal
Level 05 · VENT 510 · 883 m ²	technical_core	883	26	27.4	25	high
Level 03 · OFFICE TSTO7 · 448 m ²	workspace	448	95	25	25	normal
Level 03 · OFFICE TSTO4 · 448 m ²	workspace	448	95	25	25	normal
Level 04 · OFFICE TSTO11 · 448 m ²	workspace	448	95	25	24.9	normal
Level 04 · OFFICE TSTO8 · 448 m ²	workspace	448	95	25	24.9	normal
Level 02 · OFFICE TSTO3 · 448 m ²	workspace	448	92	25	24.3	normal
Level 01 · PARKING 150 · 408 m ²	parking_shelter	408	98	25.9	22.8	watch
Level 05 · RECREATION 520 · 181 m ²	amenity	181	104	25	21.9	normal
Level 01 · RESTAURANT 1000 · 244 m ²	amenity	244	98	25	18.6	normal
Level 02 · OPEN OFFICE 220 · 355 m ²	workspace	355	73	25	17.5	normal
Level 01 · LOBBY 100 · 268 m ²	circulation	268	70	25	16.2	normal

Appendix B - Zone-equipment mapping sample

Zone	Devices
zone_0Q4MSUQx531vKL_w06AgFH	Air Terminal Open Office 430, Lighting Circuit Open Office 430, Plug Circuit Open Office 430
zone_0Q4MSUQx531vKL_w06AgFJ	Air Terminal Staircase 401, Lighting Circuit Staircase 401, Plug Circuit Staircase 401
zone_0tWM7C8ybBZQ4c5DL1_lwj	Air Terminal Restaurant 1000, Lighting Circuit Restaurant 1000, Plug Circuit Restaurant 1000
zone_0tWM7C8ybBZQ4c5DL1_lzg	Air Terminal Auditorium 130, Lighting Circuit Auditorium 130, Plug Circuit Auditorium 130
zone_1xBFBS5N18MfdblikYnUB5	Air Terminal Open Office 330, Lighting Circuit Open Office 330, Plug Circuit Open Office 330
zone_1xBFBS5N18MfdblikYnUBD	Air Terminal Staircase 302, Lighting Circuit Staircase 302, Plug Circuit Staircase 302
zone_2EmhthfYTF_hx0gAAa2KtI	Air Terminal Business Space 140, Lighting Circuit Business Space 140, Plug Circuit Business Space 140
zone_36Blhdds16DOgkiAVsP5oS	Air Terminal Meeting 547, Lighting Circuit Meeting 547, Plug Circuit Meeting 547
zone_3H2AkZFqzChQTN2UOTW_7V	Air Terminal Staircase 201, Lighting Circuit Staircase 201, Plug Circuit Staircase 201
zone_3jzuKaCoj7duM8YUpX6ldZ	Air Terminal Kitchen 110, Lighting Circuit Kitchen 110, Plug Circuit Kitchen 110
zone_3xtnrBUgHBCwRh_xfyB1VR	Air Terminal Open Office 230, Lighting Circuit Open Office 230, Plug Circuit Open Office 230
zone_3xtnrBUgHBCwRh_xfyB4IZ	Air Terminal Open Office 220, Lighting Circuit Open Office 220, Plug Circuit Open Office 220
zone_3xtnrBUgHBCwRh_xfyB626	Air Terminal Parking 150, Lighting Circuit Parking 150, Plug Circuit Parking 150
zone_3xtnrBUgHBCwRh_xfyB8zE	Air Terminal Lobby 100, Lighting Circuit Lobby 100, Plug Circuit Lobby 100

EnergyPlus and simulation readiness

- Geometry, constructions, schedules and internal loads are parsed from IDF inputs.
- IdealLoadsAirSystem zone HVAC is available for baseline and counterfactual runs.
- The report preserves source-state provenance so control decisions remain auditable.

Management assessment

The building has 308 zones with 286 abnormal findings and 602 metadata gaps.