Transforming Building Performance at 3 Pancras Square

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A Proven Case Study in Energy Savings, Carbon Reduction & Healthier Workplaces

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The Challenge

3 Pancras Square (3PS) is a 10-storey premium commercial office at King's Cross, London — home to Havas, one of the world's largest media and communications groups, and owned by King's Cross Group.

The building was **already considered energy-efficient**: it had 70% heat recovery, existing CO_2-based ventilation optimisation, and an energy-conscious landlord and occupier. There were few obvious gains left to find.

In 2024, Havas asked Envelo to explore whether meaningful further savings were possible — without upgrading HVAC infrastructure. By the end of 2025, Envelo had delivered independently validated results compelling enough to earn whole-building deployment approval. **As of May 2026, Envelo controls fresh air ventilation across the whole building** — the first time a single intelligent system has managed ventilation for the entirety of 3 Pancras Square.

"Envelo's SaaS solution has been instrumental in delivering energy savings and IEQ improvements in the face of a technically challenging environment."
— Joe Nettleton, Building Services Director, Havas UK

The Envelo Solution

Envelo is a **software-first, SaaS ventilation optimisation platform** that continuously balances energy efficiency and indoor air quality — automatically, without manual intervention.

Using real-time IoT sensor data (CO_2, humidity, temperature, VOCs, particulate matter) alongside outdoor conditions, Envelo generates intelligent instructions delivered directly to a building's existing Building Management System (BMS). No new HVAC infrastructure or BMS hardware is required.

Envelo operates as an intelligent optimisation layer above the BMS — handling complex multi-variable logic within its own platform and delivering clear, pre-computed instructions to the BMS. Battery-operated sensors make deployment fast and non-disruptive, even in occupied buildings.

At 3PS, Envelo used two core levers on the building's Constant Air Volume (CAV) system:

- **Turndown** — modulating airflow within the available range when ventilation is needed
- **Turnoff** — switching ventilation off entirely during low-occupancy or healthy-air periods, for an average of **21 hours per week per floor (42% of operating hours)**

The received wisdom is that demand-led ventilation requires an expensive VAV system upgrade. ***3PS proves that assumption wrong.***

The Results — Independently Validated

All energy savings have been independently validated by **Hoare Lea**, one of the UK's leading engineering consultancies, commissioned by King's Cross Group.

⚡ Energy & Financial Performance

Metric	Independently Validated (70% of Building)	Whole Building Estimate
Reduction in ventilation energy	31%	30%
Annual energy cost saving	£30,000	£46,000
Net annual return after all costs	£13,000	£23,000
Payback period (capex + opex)	13 months	13 months
Annual ROI (from year 2 onwards)	76%	97%

🌍 Carbon & Sustainability Impact

- **31 tCO_2e** annual carbon saving (whole building, location-based Scope 2)
- **5.8% sustained reduction** in Havas UK&I's total Scope 2 carbon emissions
- **Exceeds 100%** of the annual Scope 2 reduction Havas UK&I needs to stay on track for its **2035 net zero target**
- Estimated **0.5–0.7 NABERS star rating uplift** for 3PS — moving it toward the top tier of rated UK office buildings

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🌿 Indoor Air Quality — Healthier, More Productive Spaces

Critically, reducing ventilation did **not** compromise air quality. It improved it:

IAQ Metric	Improvement
Time when CO_2 exceeds 1,200 ppm (unhealthy threshold)	**Reduced by 23% / 82 minutes per room per week**
Time in overly dry air conditions (winter)	**Reduced by 34% / 17 hours per week**
PM2.5 breaches above 12 µg/m^3	**Reduced by 70–100%**
VOC exposure above 250 ppb	**Reduced by ~20%**

Harvard T.H. Chan School of Public Health research (COGfx studies) demonstrates that cognitive performance can more than double in well-ventilated environments. Applying these findings conservatively to 3PS's average of 1,000 occupants, the IAQ improvements Envelo delivers indicate **potential productivity gains of ~£1.5 million per year** — a figure not included in any of the energy-based financial calculations above.

Scaling to Any Building

The 3PS results are the **floor, not the ceiling**. The building used a more constrained CAV ventilation system. For the majority of modern offices — which use Variable Air Volume (VAV) systems — results are stronger still:

Metric	3PS (CAV) Whole Building	Equivalent Building with VAV
Energy saving	30% / £46k/yr	**37% / £57k/yr**
Carbon saving	31 tCO_2e/yr	**38 tCO_2e/yr**
Net return after all costs	£0.10/sq ft	**£0.16/sq ft**
ROI (from year 2+)	97%	**141%**
Payback period	13 months	**11 months**

Simple Per-Square-Foot Economics

Cost/Return	Per Sq Ft
One-time deployment (hardware, install, commissioning)	**15p/sq ft**
Annual service cost (SaaS + IoT maintenance)	**14p/sq ft**
Net annual return after all costs — 3PS (CAV)	**10p/sq ft**
Net annual return after all costs — VAV equivalent	**16p/sq ft**

A 100,000 sq ft VAV office building would generate a net annual return of £16,000 after all costs — every year, from energy savings alone — before any value attributed to productivity gains, reduced HVAC maintenance or certification benefits.

Beyond Energy: The Full Value of Envelo

Benefit	Detail
Productivity gains	~£1.5m/yr estimated for 3PS based on Harvard COGfx research
Reduced sickness & absenteeism	Lower CO_2 and less dry air reduce airborne illness transmission and physical symptoms
HVAC asset longevity	~21 fewer operating hours/week reduces plant wear, filter replacements and maintenance costs
Certification support	Continuous IAQ and energy data supports NABERS, WELL v2 and SmartScore pathways
100% platform uptime	Demonstrated throughout 2025 and 2026 across all deployment phases
Portfolio scalability	Standard BMS protocol connectivity means consistent, friction-free rollout across multiple buildings

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Why 3PS Matters

With a constrained HVAC system and prior optimisation of ventilation, this was not an easy building to improve. Despite these and other challenges, Envelo delivered the following outcomes without touching the HVAC infrastructure:

✅ 31% energy reduction
✅ 31 tCO_2e annual carbon saving
✅ Improved air quality across every measured metric
✅ 13 months payback

Energy savings independently validated by Hoare Lea. Financial returns based on independently validated methodology. Whole-building estimates and VAV projections use the same Hoare Lea

methodology, extended consistently. Productivity estimates based on Harvard T.H. Chan School of Public Health COGfx research with conservative assumptions applied.