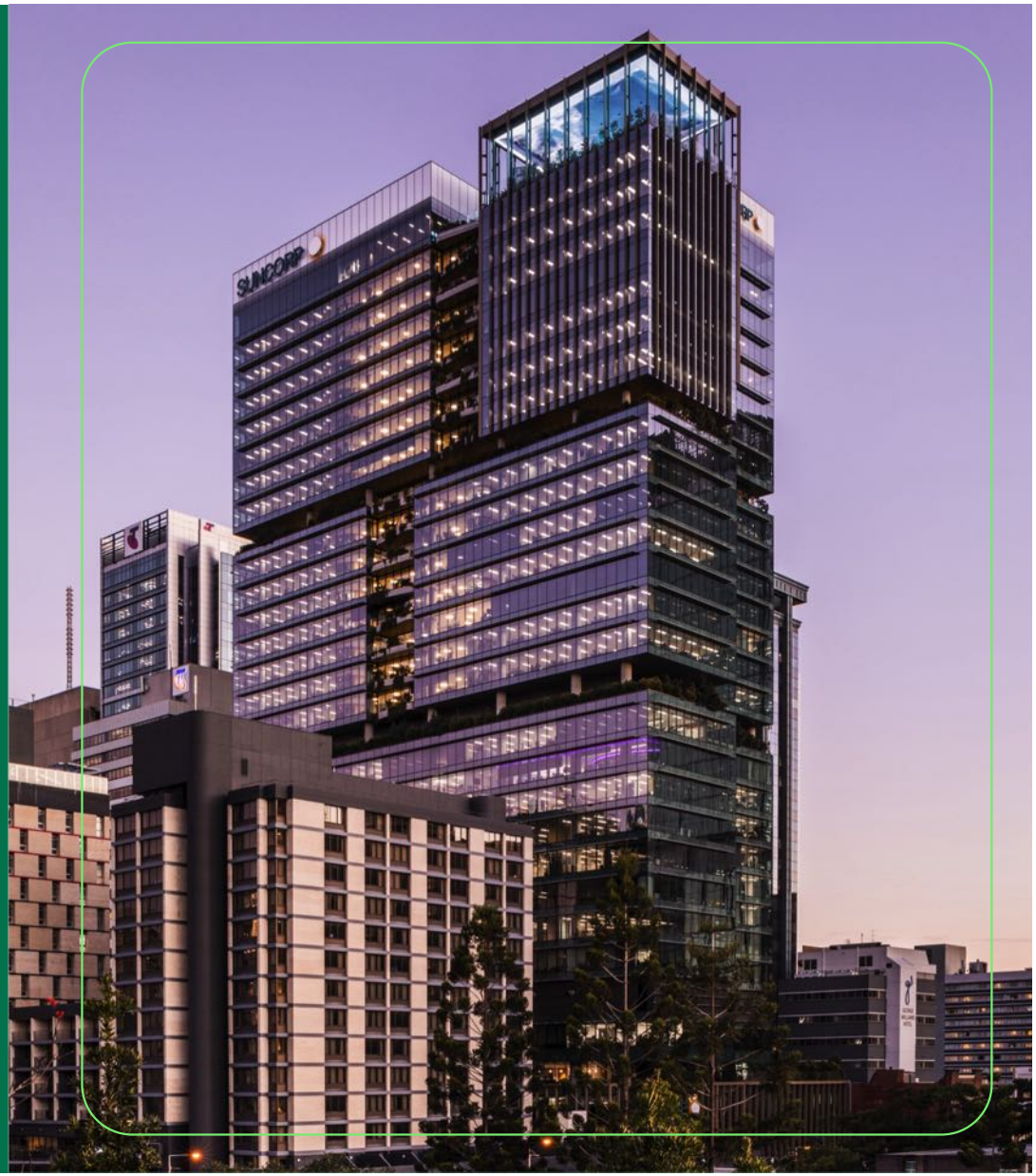
Condition-Based Maintenance in the Age of AI

Putting the Tools in the Right Hands

Haibo Chen | Head of Global Services | Smart Building Show 2026

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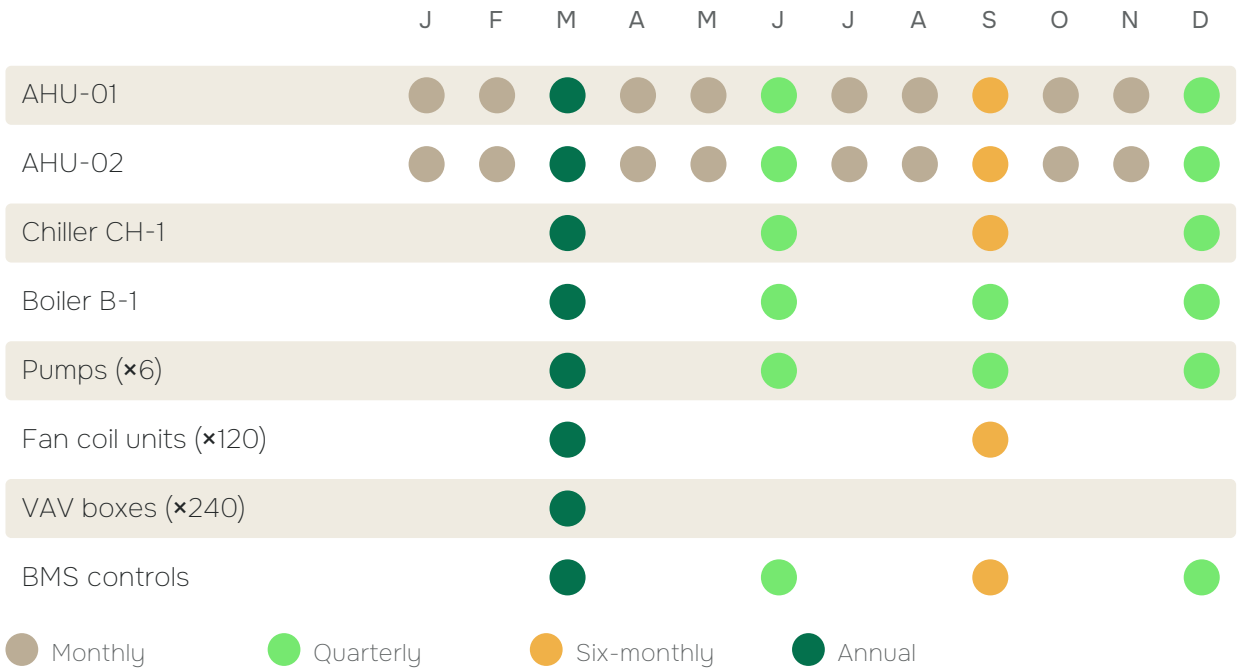
Nobody ever has enough maintenance budget.

So why spend most of it checking equipment that's working?

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What a PPM schedule looks like

Planned preventive maintenance (PPM): a fixed calendar of tasks for every asset, at set frequencies, usually based on SFG20.



1 Cost

Paying to check equipment that's already working.

2 Breakdowns between visits

Equipment still fails between visits; call-outs cost extra.

3 A snapshot in time

A visit sees one moment, sometimes with the plant switched off.

Illustrative and simplified: not from any client or SFG20 wording.

Thousands of scheduled tasks a year, built on assumptions rather than evidence.

Three models, not one

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Planned preventive

WHAT DRIVES THE WORK

The calendar

DATA NEEDED

None

WHERE IT FITS BEST

Statutory and safety tasks. Physical tasks: filters, belts, cleaning. Assets with no data.

Condition-based

WHAT DRIVES THE WORK

Evidence of a fault or drift

DATA NEEDED

Mostly BMS and meter data you already have

WHERE IT FITS BEST

Most routine HVAC checks: valves, dampers, schedules, setpoints, coils, controls.

Predictive

WHAT DRIVES THE WORK

A forecast of failure

DATA NEEDED

Long equipment history, sometimes extra sensors

WHERE IT FITS BEST

Critical assets with rich history: chillers, compressors, key pumps and fans.

Not either/or: in practice, the data shapes the contract and directs work to real faults.

Through an SFG20 lens

SFG20 already ranks every task by criticality. That's a natural place to decide what data can verify.

Red

Statutory / legal

Stays on the calendar. Data can support, never replace.

Pink

Business critical

Data flags issues early; the checks stay, with people verifying.

Amber

Optimal performance

Strong candidates to reduce or remove at retender.

Green

Discretionary

Let the data decide whether it stays on the checklist.

>50% of non-statutory SFG20 HVAC and BMS tasks can be automated with fault detection checks.

Bueno analysis of SFG20 HVAC and BMS schedules; statutory (red) tasks excluded.

What data you actually need

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Already in your BMS: no new hardware

Temperatures and setpoints

Is the space, coil or supply air where it should be?

Valves, dampers and run status

Are they modulating, stuck, or running when nobody's in?

Energy and sub-meters

Is consumption drifting from the baseline?

Still needs hands and eyes

Physical wear and condition

Filters, belts, bearings, visible damage, cleanliness

Statutory inspections

Gas safety, pressure systems, fire, water hygiene

Assets with no data

Anything not connected or not well mapped

Most buildings with a BMS already have the data they need for automated condition-based maintenance.

Most checks confirm healthy equipment is healthy

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ONE AIR HANDLING UNIT

56

checks done from data

3

failed

ONE BUILDING · 1,976 ASSETS

48,081

checks done from data

192

failed

99.6%

of checks in this building found nothing wrong

Under PPM, a person is paid to do every one of them, by hand, on a schedule.

Example commercial building. Checks mapped to DA19, the Australian maintenance standard (SFG20 is the UK equivalent).

Even faulty equipment fails only a handful of specific checks.

The longest list vs the list that matters

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Sorted by date raised

Zone temp sensor offline · L4	
Filter differential pressure high · AHU-2	
FCU out-of-hours run · L7	
Chilled water valve passing · AHU-3	
VAV damper stuck · L11	

Sorted by impact

Chilled water valve passing · AHU-3	£5,800 / yr
FCU out-of-hours run · L7	£2,400 / yr
VAV damper stuck · L11	£1,200 / yr
Filter differential pressure high · AHU-2	£560 / yr
Zone temp sensor offline · L4	£150 / yr

Illustrative figures, estimated with typical UK assumptions (see notes).

Maintenance, finally quantified: an investment decision, not a checklist.

From data to instruction, with almost no human effort

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AUTOMATED

1. Collect

Every asset, every few minutes

AUTOMATED

2. Check

Thousands of checks, continuously

AUTOMATED

3. Diagnose

Root cause, not just the symptom

AUTOMATED

4. Quantify and rank

£ impact, comfort and risk

AUTOMATED

5. Instruct

Work order in the CMMS/CAFM

TECHNICIAN

6. Fix

Arrives knowing what, where and why

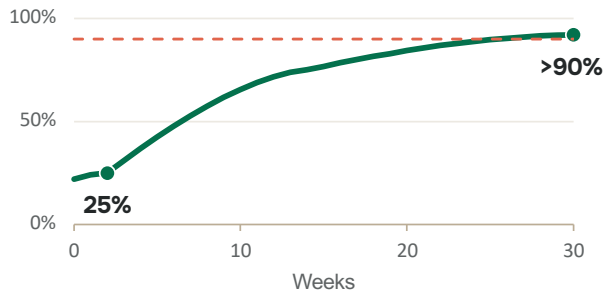
AUTOMATED

7. Verify

Data confirms the fix; the job closes or reopens itself

Earned, not assumed

Valve hunting detection: experts reviewed every result until accuracy passed 90%. Now fully automated for all customers.



Almost no human effort applies once an algorithm has earned it.

Until then, experts review results and their corrections improve the algorithm.

People spend their time on the fix, not the finding.

8 SITE FRENCH HOSPITALITY PORTFOLIO

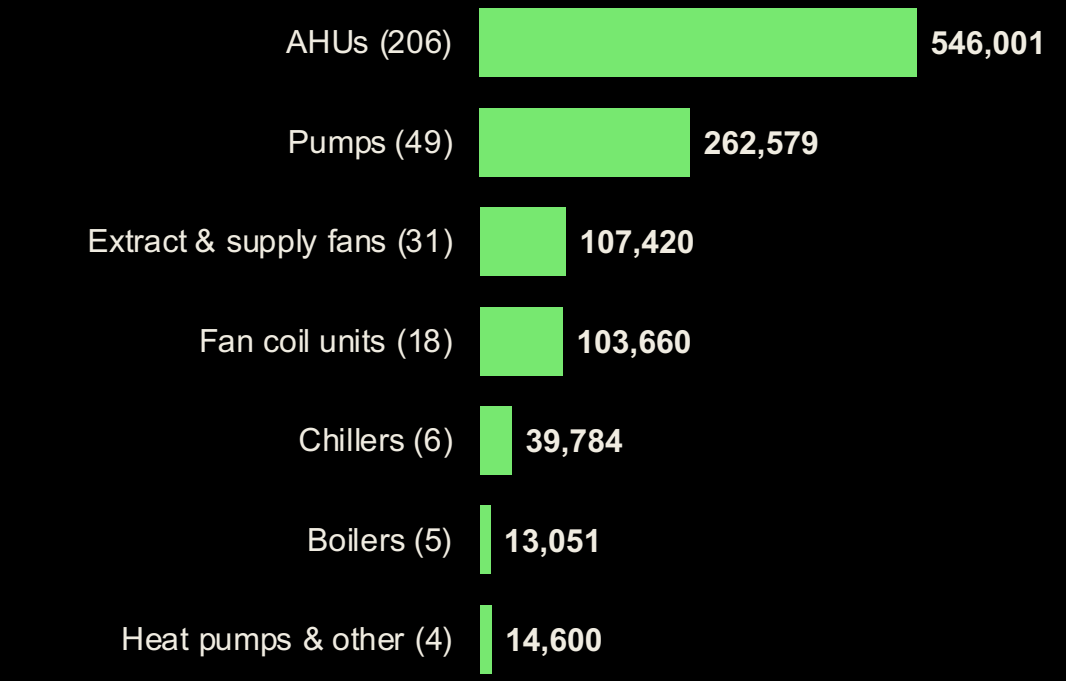
Unnecessary run hours removed

1.09M

equipment run hours avoided every year

319 units · 119 Actions in progress or completed

RUN HOURS AVOIDED PER YEAR, BY EQUIPMENT



Total (319 units) **1,087,094**

Source: Bueno Analytics for major French hospitality client, Actions in progress or completed (rejected excluded), Oct 2026.
Excess runtime per unit, annualised.

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What it delivers

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Office portfolio

22% less PPM time

A$25k value delivered per building per year (≈£13k today; likely more at London costs)

Same budget

Grocery chain · 1100 sites

37% Reduction in refrigerant loss

1,885 Avoided emergency call-outs

$100M Annual electricity savings vs. baseline

Asset life · portfolio

1.09M unnecessary run hours removed per year

148 short-cycling compressors found

16% of plant operating hours cut

Smarter maintenance doesn't need to cost more.

The real barriers, and what helps

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Contracts still require checklists	Use the evidence to retender with a leaner checklist; keep statutory tasks
Alert fatigue and trust	Ask how accurate each check is, on buildings like yours
Another system to log into	Instructions flow into the CMMS / CAFM the team already uses
“Is this replacing me?”	No: less time checking, more time fixing

Make every maintenance hour count

1

Your building can already do this

Most buildings with a BMS have the data, and more than half of non-statutory HVAC and BMS checks can be done from it.

2

Maintenance can be an investment decision

With every fault valued in £, choose where your budget earns the best return, instead of paying to work through a list.

3

Smarter maintenance doesn't need to cost more

Same budget, and nobody replaced: less time checking, more time fixing.

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Thank you
Questions?

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Good. Better. Bueno

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