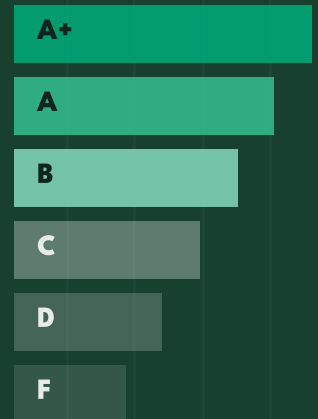


Interact.



— PRACTICAL GUIDE · PUBLIC SECTOR TECHNOLOGY LEADERS

Measuring what your estate **actually** **does.**

A practical guide to sustainable, efficient data centres.

500+

data centres measured

A decade

of measured performance data

4 steps

a method you can follow

Drawn from a workshop with public sector data centre leaders, and from a decade of measured performance data across more than 500 data centres.

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4

Steps, one cycle

If you only read one section, read Part 2. It sets out the method the rest of the guide builds on.

Why this guide exists

Public sector data centres are being asked to do more, with less energy, less water and a shrinking margin for error. Grid congestion is real, AI workloads are arriving fast, hardware is getting more power hungry, and sustainability reporting is moving from optional to mandatory.

Grid congestion

capacity can't simply be plugged in

AI workloads

arriving fast, power dense

Hungrier hardware

more watts per chip, every year

Mandatory reporting

optional is becoming required

This guide brings together the questions technology leaders in the sector are actually asking, and sets out a practical way to answer them. It is built on one simple idea: you cannot improve what you have not measured, and most estates are measured in the wrong place.

THREE NUMBERS WORTH KNOWING

PUE

The building

Total facility energy divided by IT energy. The figure most people know, but it says nothing about what the IT delivers.

ITEE_{sv}

The servers

Server work delivered per unit of energy (ISO/IEC 30134-4). This is where most of the energy, and the opportunity, sits.

WUE

The water

Litres of water used per kWh of IT energy. Now part of EU reporting alongside PUE.

THE CORE IDEA

74%

to

83%

of total energy use is the IT itself, in a well run estate

IT: where the energy goes

Facility

Illustrative split, midpoint of the measured range

Most data centre efficiency is judged at the facility level: how much energy the building burns around the IT. But the IT itself is where most of the energy goes. **The real efficiency story sits inside the servers, and that is where almost no one is looking.**

PART 01

The pressures you are facing

Energy, water, AI and hungrier hardware are reshaping what an estate has to do, and why configuration matters more than age.

01

PART 1

The pressures you are facing

Energy and water are finite, and demand is not slowing

Energy and water are no longer background costs, they are hard constraints. Grid congestion means new capacity cannot simply be plugged in, and water used in cooling and embedded in power supply is a growing local pressure, not a line in a report written after the fact.

There are three ways to respond, and the strongest estates use all three:

1

Efficiency

Every watt and litre put to better use across the whole platform, with the focus on the IT, where most of the energy actually goes.

2

Consistency

Consistent, predictable workloads let you plan capacity tightly. Smarter scheduling of heavy jobs can cut peak energy demand significantly.

3

Supply

Supply chains are tight, asset costs are rising and access to new hardware and compute is not guaranteed. Getting more from what you already own reduces exposure to all three.

Efficiency alone will not keep pace with AI

AI is driving both total electricity demand and power density upward at the same time. Individual chips are heading toward thermal design power in the thousands of watts.

3.3x

per year growth in computing capacity from AI chips since 2022

41.5%

per year rise in average data centre GPU power, 2021 to 2025. [Our GPU research](#)

The honest position

Efficiency per task is improving quickly, but demand is growing faster, so total energy keeps climbing. Efficiency slows the curve, it does not reverse it. Anyone promising that efficiency alone will solve this is overselling it.

What efficiency does is make every unit of installed capacity count, which matters more, not less, when capacity is scarce.

Server configuration matters more than server age

The instinct to replace hardware on a fixed cycle, or to assume the newest generation is always more efficient, does not hold up against measured behaviour.

A well configured previous generation server can match or beat a new one. Replacing it early means paying twice: once for hardware you did not need, and again in the embedded carbon of manufacturing the replacement.



WHAT THE MEASUREMENTS SHOW



Illustrative of relative efficiency per unit of energy.

THE LESSON

Measure the configuration and its real output before you decide to replace it.

[See it in practice: 3x the compute for the same spend →](#)

PART 02

A method you can follow

Four steps that keep the efficiency of your IT improving over time: analyse, baseline, simulate, then execute and measure again.

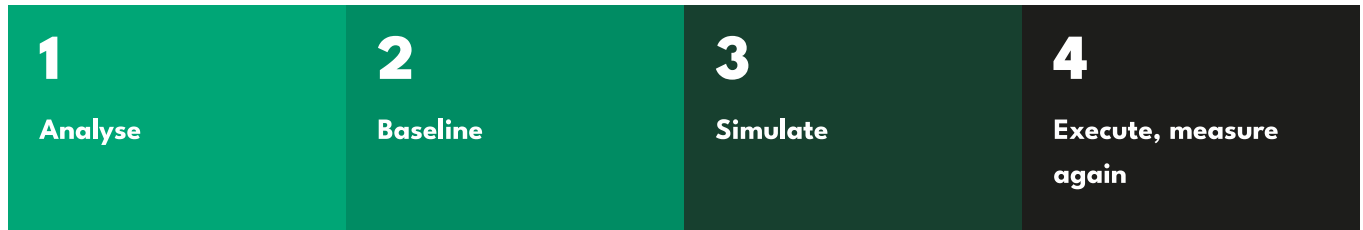
02

02

PART 2

A method you can follow

The questions above all point to the same need: a clear, evidence based way to understand what your estate does, and to decide what to change. This is a four step cycle that keeps the efficiency of your IT improving over time rather than drifting.



↪ then back to step 1: continuous, not a one off audit

1 Analyse your IT infrastructure

Start with what you actually have. Most operators keep an asset inventory, but far fewer know the make, model and real performance of the servers in it. You cannot plan around an estate you cannot see.

- Capture server configurations, storage and any GPU or AI hardware.
- Grade each server on what it delivers per unit of energy, not on its spec sheet.
- Use a recognised measure so the result is comparable and defensible.

2 Build a baseline report

Turn the analysis into a clear picture of where you stand today, the baseline every later decision is measured against, and what reporting obligations will increasingly ask you to produce.

IT performance and utilisation

Energy consumption

Associated emissions

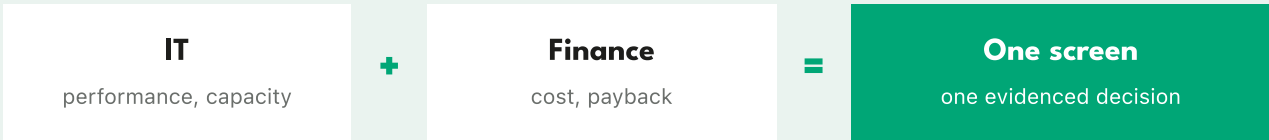
3 Simulate the change before you commit

This is the step that changes the conversation. Instead of arguing from instinct, model the options against measured behaviour and see the real figures side by side. Rightsizing, reconfiguration, consolidation or replacement can all be compared before a penny is committed. [How Interact Verify does this →](#)

EACH OPTION, COMPARED ON

Spend	Performance	Energy	Carbon	Water
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WHY SIMULATION MATTERS



Finance and IT usually argue from different evidence. A simulation puts both on the same screen, so the decision is made on what the evidence supports, not on whose instinct wins.

4 Execute, then measure again

Carry out the chosen projects backed by a clear environmental and financial business case. Then measure again, because the cycle only works if the efficiency score keeps moving in the right direction. It is continuous, not a one off audit.

RIGHTSIZING	RECONFIGURATION	CONSOLIDATION	DECOMMISSIONING
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— PART 03

The questions leaders are asking

Five themes raised by public sector technology leaders, each with a practical, evidence based answer.



03

PART 3

The questions leaders are asking

These are the themes raised by technology leaders across the public sector, with a practical answer to each.



Q1

HARDWARE LIFECYCLE

Should we extend hardware lifecycles, and how far?

Often yes, but decide it on evidence, not on age. There is strong evidence that capable servers can stay in service well beyond common refresh cycles. Look at total cost of ownership, not just operational costs: weigh the purchase price and running savings of a newer generation against the embedded carbon of manufacturing a replacement, and against failure rates, support and spare parts. Measured per component failure rates are low for most parts, so the risk is usually smaller than assumed. Measure the specific configuration before extending or replacing it. [Case study →](#)



Q2

MEASUREMENT

What new reporting is coming, in Europe and beyond?

In the EU, data centres above 500 kW already report energy, water and renewable use under the Energy Efficiency Directive, and the new rating scheme will turn that into a label with A to G grades for PUE and WUE. Germany's Energy Efficiency Act sets binding PUE targets and renewable energy requirements, and Singapore ties new capacity to strict efficiency standards. The direction everywhere is the same: transparent, standardised figures that can be compared across operators. [Our read of the EU scheme →](#)



Q3

WORKLOADS

Where should we run workloads, including AI?

Treat it as a placement decision, not a default. Where a workload runs has a real effect on cost, energy and emissions, and AI makes that sharper because its hardware is so power dense. The right approach is to classify workloads first: which must be on premises for sovereignty or latency, which can be consolidated, and which genuinely need the largest AI hardware. Much inference does not. Model the options before building or buying for AI.



Q4

REPORTING

How do we prepare for tighter reporting and rating schemes?

Build the baseline before you are asked for it. The bar is moving from facility level estimates to standardised, comparable, hardware level evidence. Facility measures like PUE describe the building, not what the IT delivers for its energy, and that is exactly where the gap is. Measured evidence per configuration is very hard to produce retrospectively, so the operators capturing it now will be the ones able to answer when the standard arrives.



Q5

STRATEGY

What is the future role of a public sector data centre?

On premises facilities remain the backbone, because they give the most control over performance, sovereignty, cost and environmental impact. The strategic job is triage: a structured decision on where each workload should run, judged against clear criteria. Government has unique leverage here, to demand transparency across the supply chain and to make decisions that serve the country long term rather than the next financial quarter.

On premises

Colocation

Public cloud

AT A GLANCE

Q1

Extend on evidence, not on age

Q2

Know what reporting is coming

Q3

Classify workloads first

Q4

Baseline before you are asked

Q5

Triage where each workload runs

Key terms

PUE	Power Usage Effectiveness. Total facility energy divided by IT energy. Describes the building around the IT, not what the IT delivers.
ITEE_{sv}	IT Equipment Energy Efficiency for servers (ISO/IEC 30134-4). Server work delivered per unit of energy. Measures the IT itself.
WUE	Water Usage Effectiveness. Litres of water used per kWh of IT energy. Now reported alongside PUE in the EU.
TDP	Thermal design power. The heat, and broadly the power, a chip is designed to dissipate under load. Rising fast for AI hardware.
Embedded carbon	The emissions created in manufacturing, shipping and disposing of hardware, before it ever runs a workload.
Total cost of ownership	Purchase price plus running, support, spares and end of life costs across the whole life of an asset.
Rightsizing	Matching hardware capacity to the workload it actually runs, so nothing is oversized or idle.
Consolidation	Moving workloads onto fewer, better utilised servers so the rest can be retired.
Baseline	A measured picture of the estate today, which every later change is compared against.
EED	The EU Energy Efficiency Directive. Requires data centres above 500 kW to report energy, water and renewable use.

Further reading

Every link below is clickable in the digital version of this guide.

CASE STUDY

3x the compute for the same spend

interactdc.com/case-studies →

INSIGHT

Inside the EU data centre rating scheme

interactdc.com/insights →

RESEARCH

GPU energy and environmental impact

interactdc.com/insights →

INSIGHT

Low carbon is not always low water

interactdc.com/insights →

SOFTWARE

Interact Verify: simulate before you commit

interactdc.com/solutions/verify →

GET STARTED

Run a simulation on your own estate

interactdc.com/buy-a-simulation →

Want to talk it through? The team is happy to walk you through your own estate.

interactdc.com

Notes

QUESTIONS TO TAKE BACK TO YOUR TEAM

A number is only useful once someone acts on it.

Measure what your estate actually does, at the level of the IT, simulate the change before you commit, and keep the cycle turning. That is how an estate stays ahead of rising demand rather than adding to it.

Measure

Simulate

Keep the cycle turning