

IEA Energy Efficiency 2025 Report: Key Signals for Data Center Cooling

What the IEA's Energy Efficiency 2025 report says about efficiency progress remaining off track, electricity demand outpacing total energy demand, and "digital optimisation" and how data center teams can interpret these signals for cooling operations.

Selected signals from the IEA report



Efficiency progress is below the COP28 ambition

- COP28 agreed to double the global annual rate of efficiency improvement by 2030
- Recent progress averages **~1.3%/year** since 2019
- That is well below the **~4%/year ambition**



Electricity demand is outpacing total energy demand

- Electricity demand has **grown 2-3x faster** than total energy demand since 2019
- In 2025, electricity demand is estimated to **rise ~3.3%**
- That's **>2x** the growth rate of overall energy demand (2025)



What's driving electricity demand growth in 2025

- Industry electricity use
- Cooling demand (buildings)
- Data centers & AI
- Electrification across end uses

What the IEA means by "digital optimisation"

In the buildings section, the IEA describes "digital optimisation" as improving performance through advanced sensors and controls, communication, fault detection, and automation, enabling smarter coordination of equipment and continuous adjustment for efficiency improvements.

The report states that "digital optimisation" applied to existing commercial facilities can typically deliver 5% to 40% energy savings, with results depending on technologies applied and building characteristics.

The IEA's quantified savings range is stated in the context of commercial buildings. Data center applicability depends on site design, controls, and operating constraints.

Practical takeaways for data center cooling teams

The IEA's framing emphasizes that efficiency gains are not only about hardware upgrades: operational performance can be improved through better sensing, control, and automation.

DATA CENTER LENS (etalytics):

Data centers use many of the same physical components found in large commercial cooling systems, but operate under tighter reliability constraints and higher load variability. The IEA's "digital optimisation" framing is a useful lens for thinking about operational capabilities that can improve day-to-day performance, while outcomes remain site-specific.

WHY THIS MATTERS NOW

Cooling controllability moves from a "nice to have" to a core capability.

- The IEA signals a tighter electricity context (see page 1)
- Improving how existing systems perform matters
- For data centers, cooling performance is a controllable lever

PRACTICAL OPERATOR QUESTIONS

"Digital optimisation" → measurable operational capability.

- Do we have the right signals to understand real performance (not just alarms)?
- Can controls adapt continuously (within safety limits) rather than relying on static logic?
- Can we detect performance drift early, before it shows up in higher energy use?



Next steps

Read the full analysis on our blog: [IEA Energy Efficiency 2025: Implications for Data Center Cooling](#)

If you'd like to sanity-check your cooling data and control setup against these themes, we're happy to compare notes.