

EUROPE · DATA CENTRES AND THE GRID

Data centres and the grid

Some thoughts on integrating data centres into the European power system,
with lessons from the US

— **Killian Daly, Executive Director, EnergyTag**

E-mail: killian@energytag.org

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Unregulated data centres would increase gas dependency and raise energy bills

The EU framework should not let data centres consume or build more gas

No clean-power conditions in electricity procurement = room for grid gas and on-site gas plants.

1 It will increase our dependency

More gas burn means more LNG imports, locking in fossil fuel demand.

2 It will raise energy bills

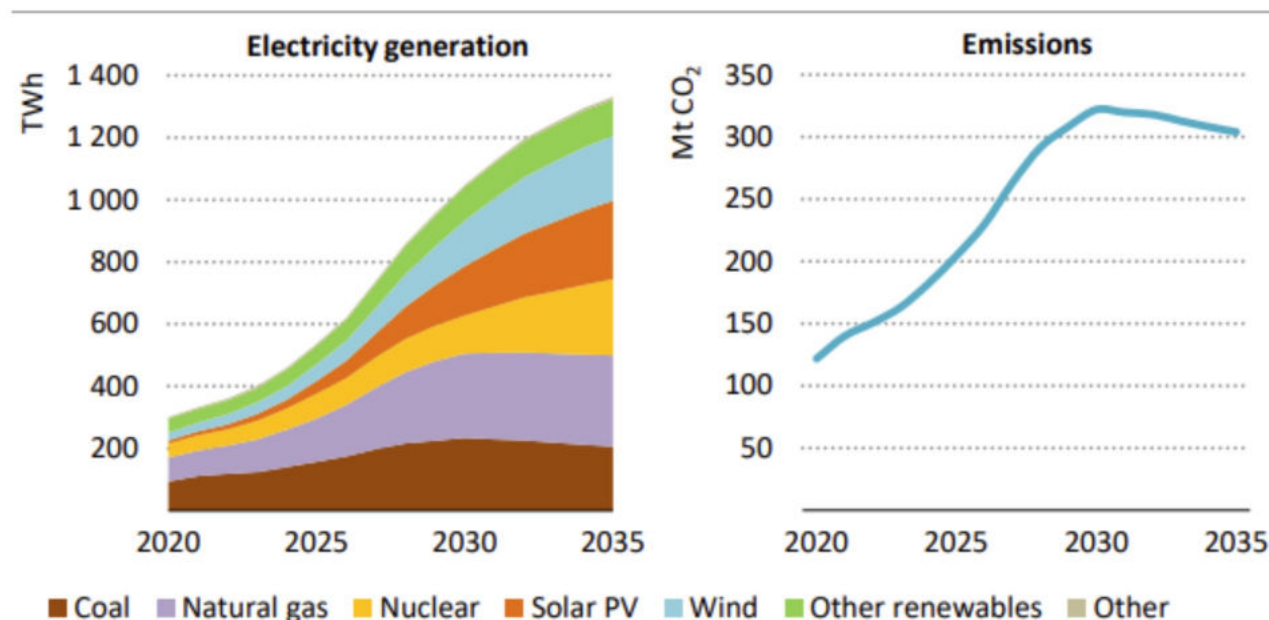
More gas means more times where it fixes the price of electricity.

3 It will weaken energy security

More exposure to volatile global gas markets means vulnerability to geopolitical shocks.

Data centres to increase fossil fuel use globally (IEA)

Figure 2.20 ▶ Global electricity generation for data centres and the associated CO₂ emissions in the Base Case, 2020-2035



IEA. CC BY 4.0.

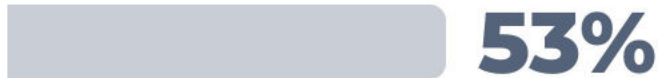
US Data centres are losing public support

Americans opposed to construction in their local area

An AI data centre



A nuclear power plant



EVEN IN TEXAS



Governor Abbott Directs TCEQ To Halt Data Center Permits

September 21, 2026 | Austin, Texas | [Press Release](#)

AI data centres can outbid everyone



Maximum electricity price at which each use stays viable, per MWh · linear scale; frontier inference bar truncated

127×

blended AI price tolerance vs. the gas benchmark

Price signals will not manage this load. *Other rules are needed.*

Unmanaged growth can raise bills

UNITED STATES • PJM

\$29.4bn

Added to PJM capacity costs by data centre load across the last four capacity auctions, per the market monitor.

IRELAND

23%

of Ireland's metered electricity went to data centres in 2025, up from 5% in 2015.

SOCIAL LICENCE

“Pay our way”

Microsoft's pledge that its data centres will not raise local power prices.

How baseload growth without clean firming pushes prices up

More gas at the margin in peak hours

Higher ETS demand under a fixed cap

Network reinforcement to serve peak

Price-insensitive buyers outbid industry

ASK 1 OF 2

Flexible integration

New data centres should not add to system demand in the peak-load hours of the year.

The 10–100 hour rule

Grid access is the bottleneck

7–10 years

Reported queues in Germany and the Netherlands. In Dublin, new connections are paused until 2030.

Flexibility is the fast lane

Grid constraints bind for only a few hours a year, so flexible load can use existing capacity sooner. Most developers say they will pay more for faster access.

Link connection priority to verified peak supply/demand flexibility

Speed to power is priority 1,2,3 for AI.

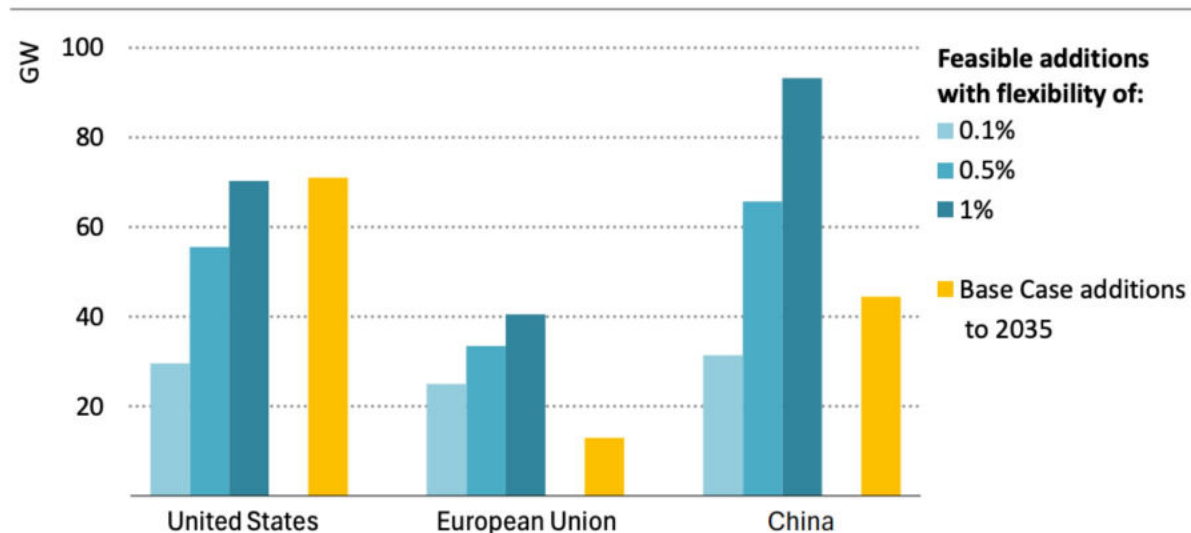
Table 2.4 ▶ Reported connection queues for new data centres in selected jurisdictions

Jurisdiction	Average time in queue
United States	1-3 years
North Virginia (United States)	Up to 7 years
California (United States)	3 years
Germany	Up to 7 years
United Kingdom	5-7 years
Netherlands	Up to 10 years
Kanto (Japan)	More than 5 years
Malaysia	Under 3 years
Queensland (Australia)	More than 2 years
Italy	Under 3 years
Spain	3-5 years
Ireland	In Dublin, paused until 2030

Sources: IEA analysis based on energy.gov (United States), datacenterdynamics.com (Virginia, Netherlands, United Kingdom), electricalreview.co.uk (Germany), businesspost.ie (Ireland) and IEA survey results (Australia, Italy, Japan, Malaysia, Spain).

Flexibility unlocks grid headroom

Figure 2.30 ▶ Data centre capacity additions to 2035 and feasible integration into the current electricity system under different flexibility cases



IEA. CC BY 4.0.

Current electricity systems can already integrate all data centre additions to 2035 if a mix of backup activation and workload management reduces grid demand 1% of the time

~2×

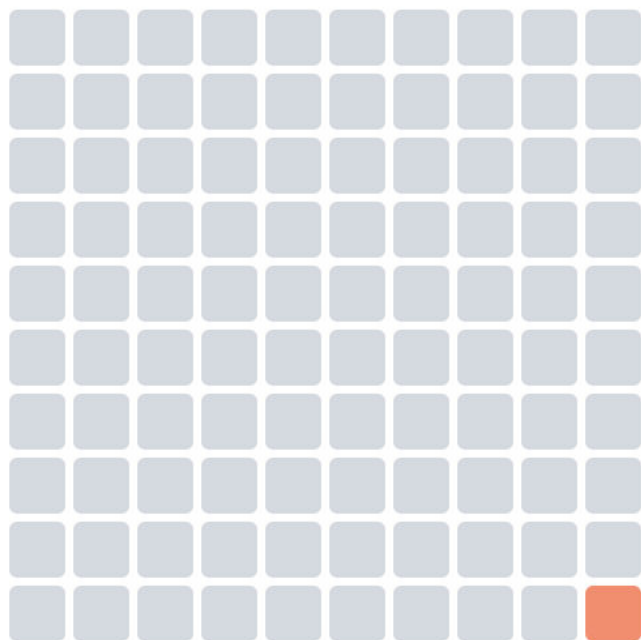
EU: flexibility for just 0.1% of the year (about 9 hours) accommodates roughly twice the projected additions to 2035.

70 GW

US: integrable in today's system at 1% flexibility, covering all Base Case additions.

Feasible means no increase in system peak demand, measured as the top 100 hours over ten weather years.

Grid stress is rare, short and partial



Each square is 1% of the year, about 88 hours. The IEA range, 0.1–1%, is roughly 10 to 90 hours.

3–5 h

Typical stress episode, aligned with existing evening or weather-driven peaks

>50%

of normal grid supply is still available in 80% of stress hours

Onsite batteries

Workload shifting

Clean backup

Precedents: Google has contracted 1 GW of data centre demand response in the US; Microsoft's Stackbo site in Sweden replaced diesel backup with 18 MWh of batteries.

ASK 2 OF 2

Hourly, deliverable clean power

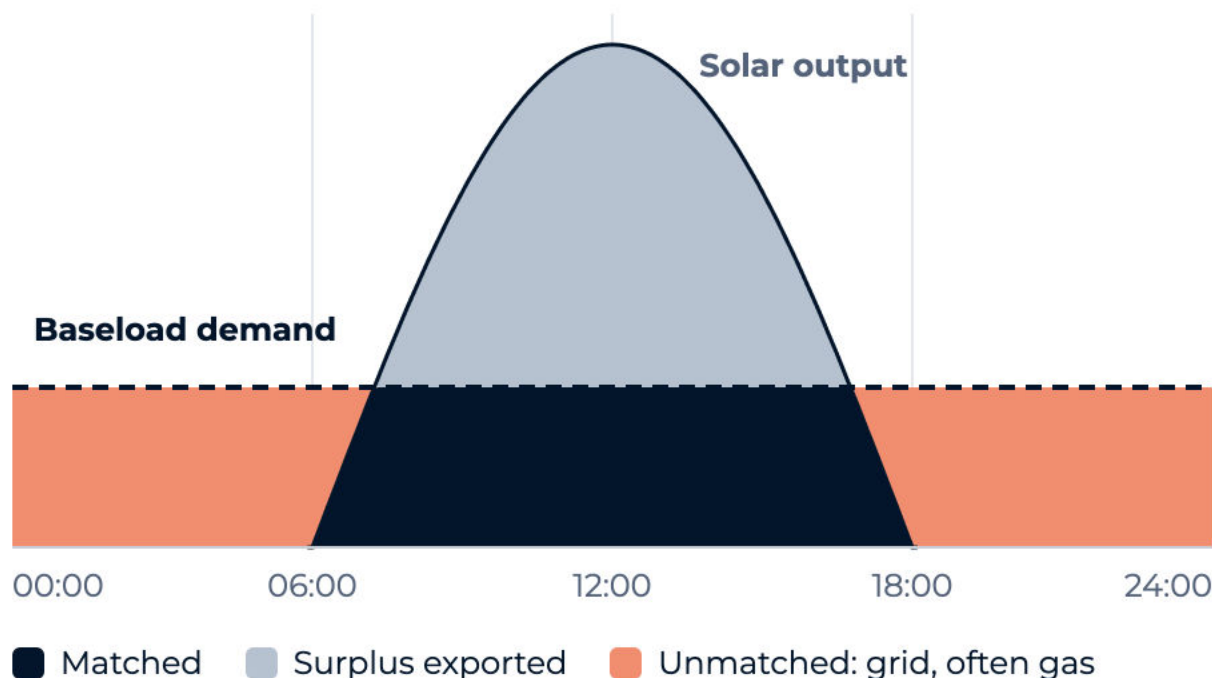
Consumption matched in the same hour, in the same bidding zone, by new clean supply.

Near

New

Now

Annual matching hides the gas hours



Share of hourly demand covered, Europe

Solar only, 100% annual match

~40%

Wind only, 100% annual match

~65%

Wind + solar, annual match

~70%

Wind + solar + batteries, hourly target

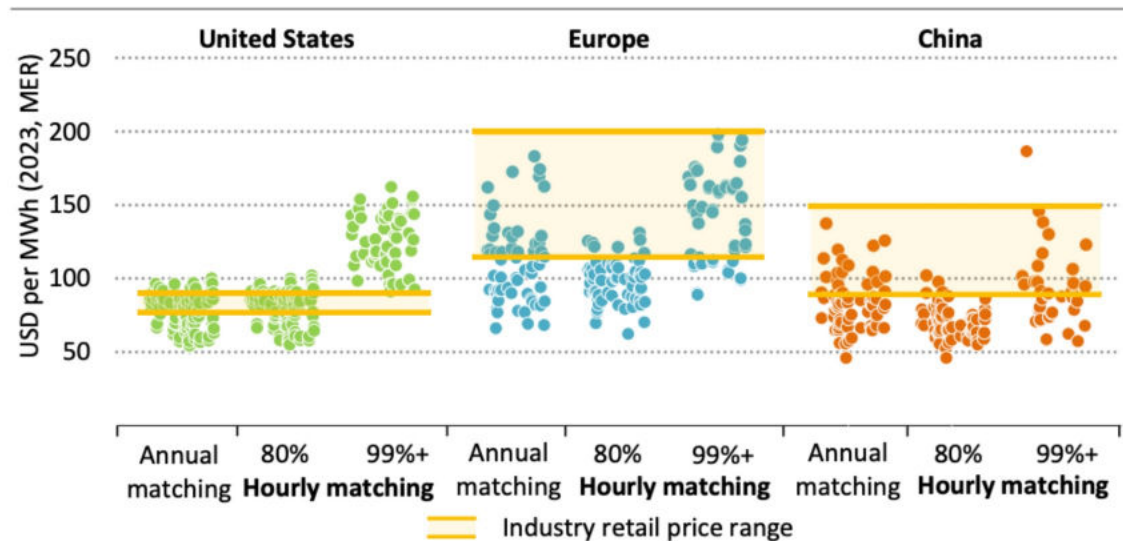
80–99%

87%

average renewable energy factor
reported by ~770 EU data centres, on
annual accounting.

High levels of hourly matching are economical

Figure 2.19 ▶ Total cost of electricity per unit consumed for hybrid options of wind, solar PV and battery in the United States, Europe and China



IEA. CC BY 4.0.

Hybrid wind, solar PV and battery portfolios can meet 80% of baseload demand at an average cost competitive with industry retail prices in the United States, Europe and China

The economics keep improving

-91%

Li-ion battery prices, 2010–2024
(USD 1,300 to 115/kWh)

-70%+

Levelised cost of solar PV over the
same period

At 2023 costs, 80% hourly matching already beats industrial retail prices in much of Europe; 90% averages about \$105/MWh.

Turn economics into practice: **a fast lane to the grid**

Developers will pay for faster grid access. Prioritise connections for projects that bring hourly-matched, deliverable clean supply and flexibility.

Near, new, now: credible clean supply



Near

Supply from the same bidding zone, so the power is physically deliverable.

Test: same bidding zone



New

Additional generation and storage, not a claim on the existing clean fleet.

Test: asset-age limit



Now

Accounted for hour by hour, so storage and flexibility get credit.

Test: hourly matching ratio

Robust hourly accounting with reasonable targets, *not a 24/7 matching mandate straight away.*

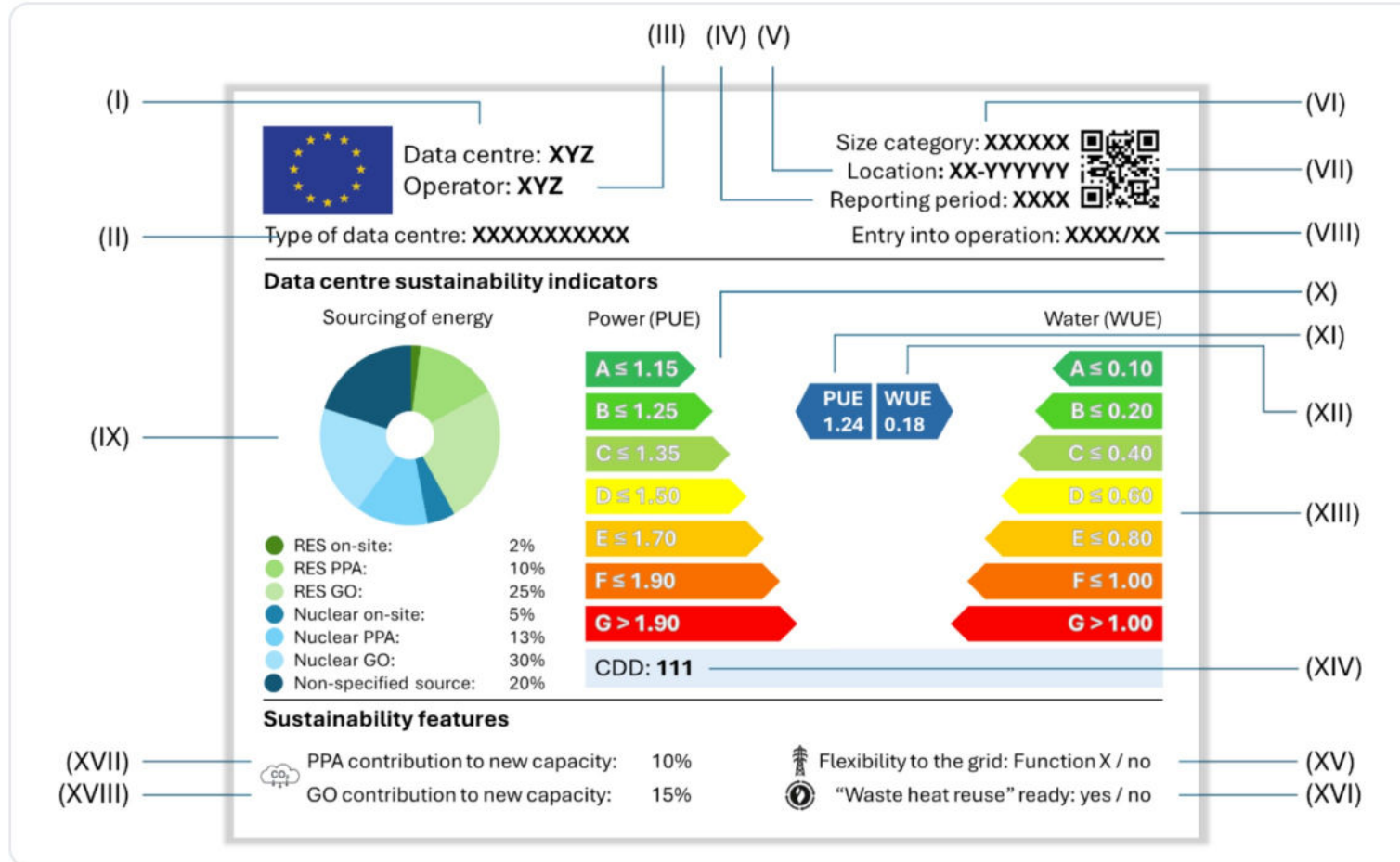
ALREADY FEASIBLE TODAY

EU markets settle every 15 minutes: the metered data already exists

Over 80% of 2025 European PPAs were physical; only ~17% virtual

Google moved 10.5 TWh to hourly certificates using existing GOs

A label *meant* to measure sustainability



IX Sourcing of energy

Annual shares of GOs and PPAs from any interconnected bidding zone. No hourly or local test.

XVII-XVIII New capacity

The only stricter measures, relegated to the footer.

XV Flexibility to the grid

A yes/no flag: any function counts, with no link to peak hours.

Looks like a solid label.

But we must look under the hood...

Looking at the details, things hollow out

NC = “contribution to new capacity”, a stricter subset shown separately on the label. Nuclear follows exactly the same rules as renewables.

SOURCING METRIC

	Near	New	Now
GOs • renewable and nuclear Any interconnected bidding zone, any asset age, matched annually	No	No	No
GO-NC • new capacity Bidding zone or Member State; assets ≤10 years; matched only as finely as GOs are issued	Partial	Partial	Partial
PPAs • renewable and nuclear Any interconnected bidding zone, any asset age, no time matching	No	No	No
PPA-NC • new capacity Adds only an asset-age test: ≤10 years, life extensions included	No	Partial	No
LEEF • headline metric All low-emission GOs, PPAs and on-site supply ÷ total energy, annually	No	No	No

FLEXIBILITY

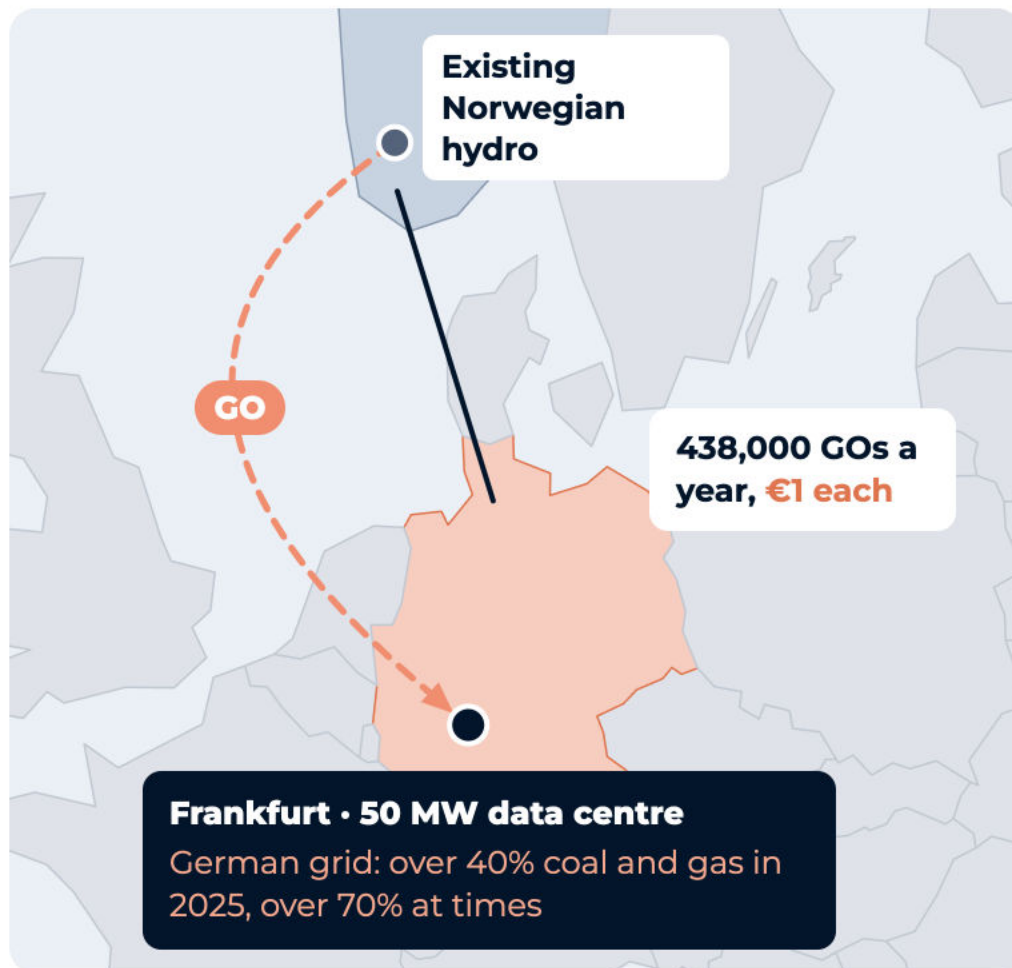
Yes / no

Any function counts, from peak shifting to frequency response. No threshold, no link to peak hours. The Commission’s guidance will even list reasons for not offering it.

A data centre can report a 100% LEEF and “flexibility: yes” while still running on gas at peak.

The label cannot show grid integration.

Low-emissions, on paper

**438 GWh**

Annual demand: 50 MW running around the clock (50 MW × 8,760 hours)

€0.44m

Norwegian GOs to cover every MWh at €1/MWh, for a LEEF of 1.0

~€39m

The same power at Germany's 2025 average wholesale price (€89/MWh)

THE LABEL SHOWS**LEEF 1.0**

"100% low-emission"

New-capacity GOs: 0%

THE GRID SEES**Coal- and gas-backed power**

No new clean capacity

Full 50 MW at peak

About 1% of the bill buys a perfect LEEF.

Nothing changes on the German grid.

Some notable policy developments

CALIFORNIA, US Signed into law**SB 887: a fast lane for clean, flexible data centres**

Fast-track review for sites running on 100% zero-carbon power every hour within five years, 75% newly built, with 4 hours of zero-carbon storage at peak for demand response.

SPAIN**Draft Royal Decree on sustainable data centres**

Sites above 1 MW: 80% hourly matching, an 18-month asset-age test and 10-year minimum contracts.

DENMARK In law**Emergency grid law**

Ranks grid access by priority: data centres last, with grid-friendly projects said to be preferred.

ILLINOIS, US**HB 5607 (in committee)**

Hourly matching ramping from 20% in 2030 to 100% by 2035, with in-state deliverability.



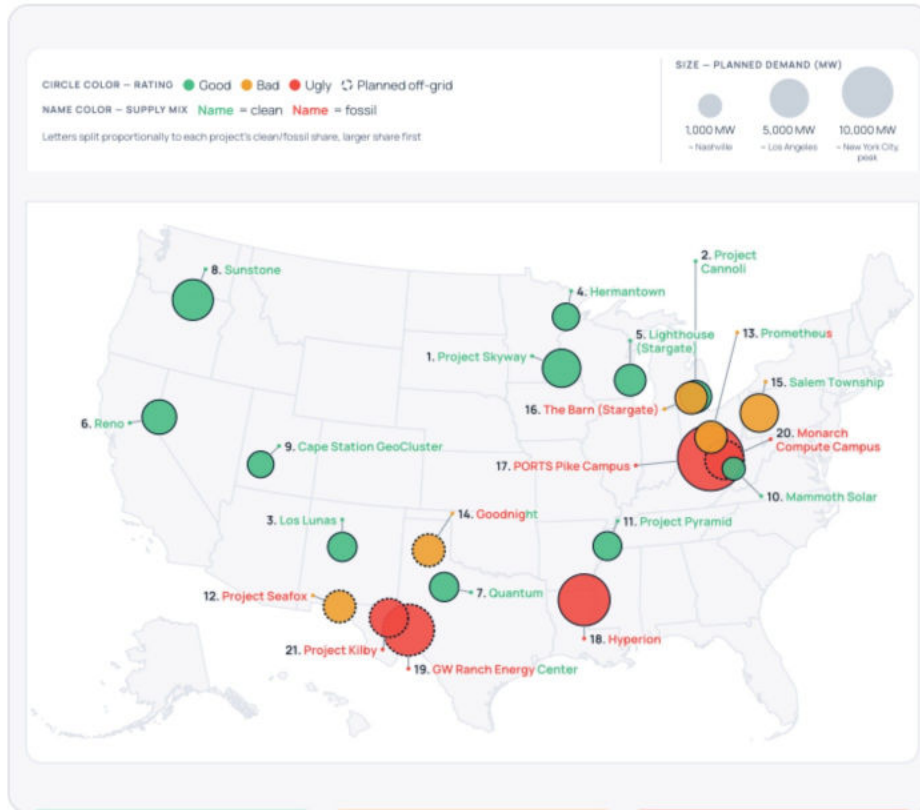
US EVIDENCE

The Good, the Bad and the Ugly

EnergyTag analysis of 21 announced US data centre power deals



New gas capacity outweighs new clean two to one



Good projects (11): new clean capacity

15.5 GW

Bad and Ugly projects (10): new gas capacity

30.8 GW

~70.6 Mt

CO₂ a year from the planned gas, about Pennsylvania's power sector

1 of 21

projects states any demand flexibility

What the three categories look like

GOOD

New clean portfolios with storage or clean firm power

Project Skyway • Google

1.4 GW wind, 200 MW solar and 300 MW storage for 1.9 GW of demand.
No new fossil capacity.

Los Lunas • Meta

885 MW solar, 100 MW storage and 150 MW geothermal for 640 MW of demand.

BAD

Little new clean power, or reliance on existing clean assets

Prometheus • Meta

Clean firm supply is largely an existing nuclear extension, alongside 614 MW of new gas.

Salem Township • Amazon

1.9 GW of existing nuclear; no new clean power.

UGLY

Historic volumes of new gas, even alongside clean power

PORTS Pike Campus • OpenAI et al.

9.2 GW of gas for 10 GW of demand; emissions comparable to Utah's power sector.

Hyperion • Meta

7.4 GW of new gas; emissions comparable to Iowa's power sector.

Without guardrails, speed-to-power defaults to gas. *The Good projects show another route.*

Two asks, ready to adopt

1 Flexible integration

- A quantified metric: no net addition to demand in the 100 highest-load system hours
- Replace binary “grid functions” flags in the EU rating scheme
- Link grid-connection priority to verified flexibility

2 Hourly, deliverable clean power

- Hourly or 15-minute matching, same bidding zone, new assets
- 80% weighted-average hourly matching now, rising to 90% by 2030
- Metered data plus monthly GOs until granular GOs are issued

Data centres can afford to anchor Europe’s clean firm power. *Policy should make that the condition of connection. There is a win-win to be found here.*



Questions?

Get in touch, or dig into the sources yourself.

killian@energytag.org

energytag.org