Data Renoversity

H -2.0.1 · Renewable + University — the AI campus that carries its own power

Eleven questions every data centre is now asked — and how Data Renoversity answers them

Investors, grid operators and communities have started to ask the same questions about energy, water and local impact. Ceres set them out as eleven principles in *Sustainable Solutions for Data Centers* (March 2026). This note goes through them one by one — on proven, bankable technology.

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WHY NOW

The buildout meets three limits: power, water, consent

Data centre demand is growing faster than grids, watersheds and local acceptance can follow.

≈ 100 GW

Additional US grid capacity needed for data centres by 2030 — about the peak demand of the UK and France together (US DOE, Duke University, cited by Ceres).

7.5 ×

In the Phoenix region the water embedded in data centres' purchased electricity (≈ 2.9 billion gallons a year) is about 7.5 times the water used on site (≈ 0.39 billion gallons) — Ceres research.

1 in 3

Roughly one third of US data centre construction sits in regions already short of water; local opposition and state legislation are spreading (Ceres).

The conventional answer — connect to the grid, cool with evaporating water, buy certificates — moves the load onto the grid, the watershed and the ratepayers. Data Renoversity starts from the other end: produce the energy where it is used, keep the site close to grid-neutral, and turn surplus into a product.

WHAT YOU WILL NOT FIND

What a Data Renoversity campus does not have

Every item below costs a conventional data centre energy, water, noise or permits. We left them out by design.

- ✕ No cooling towers — no plume, no drift, no Legionella risk
- ✕ No evaporative or adiabatic cooling — no water sprayed into the air
- ✕ No fogging or evaporative inlet cooling on the turbines
- ✕ No evaporative cooling water — power-island process water is small and reported separately
- ✕ No water-treatment chemicals for cooling, no blowdown discharge
- ✕ No oil-lubricated, fixed-speed or legacy compressors
- ✕ No high-GWP refrigerants
- ✕ No dummy loads burning energy to smooth AI training swings
- ✕ No diesel backup gensets
- ✕ No peak demand pushed onto the public grid
- ✕ No network upgrades charged to local households
- ✕ No new greenfield land — former power-plant sites first

WHAT IT DELIVERS

Our results

Cooling energy as a share of the IT load, water, efficiency and noise — against a conventional data centre.

−2 % · 0 · +1 %

Cooling energy as a share of the IT load in the three operating configurations — at best the cooling system gives energy back. Conventional sites spend about 10–40 %.

Zero

Evaporative cooling water. Closed loop throughout; no cooling towers, nothing sprayed into the air.

Max η · min dB

Latest-generation oil-free magnetic-bearing chillers, used only when needed: highest part-load efficiency, quietest machines, no tower fans.

Nature in, nature out

Energy and heat are taken from nature and returned to it within the same cycle — nothing evaporated.

Item	Conventional data centre	Data Renoversity
Cooling energy	10–40 % of the IT load	**−2 % to +1 %**
Cooling water	1–2 L/kWh with cooling towers (≈ 0.65–1.3 million m³/yr for 100 MW IT)	**Zero evaporative cooling water; staff water and small power-island process water, reported separately**
Water in the electricity	3–6 × the site water on thermal-heavy grids	**≈ 0 — renewables first, made on site**
Chillers	Screw / older compressors, oil-lubricated, running all year	**Oil-free magnetic-bearing centrifugal, low-GWP refrigerant, trim duty only**
Backup power	Diesel gensets	**Battery on site and on-site generation**
Grid	Large peak demand, grid upgrades	**Grid-neutral; surplus turned into hydrogen as a product**

WATER

Most of a data centre's water comes through the power cable

Same 100 MW IT data centre (PUE 1.25, site WUE 0.3 L/kWh), different grids — WaiMAP data-centre sustainability scorecard

Grid	Site water m³/yr	Embedded in grid power m³/yr	vs site
Germany	197,100	588,836	**3.0 ×**
United States	197,100	797,434	**4.0 ×**
Finland	197,100	891,877	**4.5 ×**
Poland	197,100	1,046,272	**5.3 ×**
France	197,100	1,148,108	**5.8 ×**

Generation mix × consumptive water factor per technology (NREL 2012 medians; hydro reservoir evaporation excluded). Indicative national mixes. Screening values.

DATA RENOVERSITY

Renewables first, produced and consumed on site — so the water embedded in bought electricity, the larger part of the footprint, largely disappears with it.

0

evaporative cooling water on site · ≈ 0 water embedded in bought electricity

Closed-loop cooling, no towers. What remains is staff water and a small volume of process water for the power island, reported separately. The cooling concept is protected; details are shared under NDA.

GRID AND COMMUNITY

Grid-neutral by design

The questions that decide a connection: how much, when, and who pays for the upgrades.

Renewables first

Solar, wind where the site has it, and batteries cover the load. H_2-ready turbines only for firming and backup. Island operation or grid connection with near-zero two-way transfer.

Surplus → hydrogen

Energy that would otherwise be curtailed is turned into hydrogen — sold as a product, kept for backup. Daily and multi-day balancing is done by batteries, the efficient way.

No ratepayer burden

No new peaking plant and no network reinforcement charged to households; the campus can offer flexibility to the grid operator instead of taking it.

For comparison, a conventional 100 MW IT site offering the flexibility Duke University proposes (≈ 50 % of the load for ≈ 40 hours a year) needs about a 31 MW / 78 MWh battery or workload shifting to earn a faster connection. Data Renoversity starts from the grid-neutral end of that scale.

Sites: closed and closing coal and gas power plants in Europe — existing grid connection and substation, water rights, industrial zoning and a workforce that knows power plants. The campus brings back skilled jobs where the old plant left.

THE ELEVEN PRINCIPLES

Ceres principles for sustainable data centres — Data Renoversity's answer

#	Principle (Ceres, March 2026)	Data Renoversity
1	Optimise site selection for clean energy, water and community impacts	Brownfield power-plant sites screened in WaiMAP for grid, water, hazards, land and community criteria.
2	Low-embodied-carbon materials, sustainable purchasing	Re-use of the existing site infrastructure (connection, substation, roads); EPDs required for steel, concrete and major equipment.
3	Contribute to watershed health and resilience	Zero evaporative cooling water; no cooling towers; process water small and disclosed.
4	Maximise water efficiency	Site WUE for cooling ≈ 0; source WUE ≈ 0 with renewables made on site; both reported.
5	Maximise on-site and community energy efficiency	Cooling energy −2 % to +1 % of the IT load; oil-free magnetic-bearing chillers on trim duty; waste heat put to use; AI load swings handled by storage, not dummy loads.
6	Maximise the use of clean energy	Renewables and batteries first, produced and consumed on site; H_2-ready turbines only for firming and backup.
7	Use demand flexibility and peak shaving	Near-zero two-way grid transfer; batteries give the campus its own flexibility.
8	Deploy smart-grid-enabled resources	Battery storage can offer services to the grid operator where the connection allows.
9	Minimise impact on local communities and ratepayers	No towers, no plume, no diesel gensets; no grid upgrades charged to households; skilled jobs on former power-plant sites.
10	Disclose key sustainability metrics	PUE, WUE (site and source), renewable energy factor and energy reuse factor disclosed per campus.
11	Advocate for fair, reliable, clean policies	Support for grid-neutral and brownfield-first siting rules.

NEXT STEP

From a closed power plant to a self-supplied AI campus

WHT runs the pre-feasibility on the site of your choice: grid and water screening, energy balance, campus layout, permitting route and the eleven-principle scorecard — in WaiMAP, with the numbers behind every answer.

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Sources: Ceres, Sustainable Solutions for Data Centers (March 2026); US DOE and Duke University Nicholas Institute as cited there; NREL, Macknick et al. (2012) water consumption factors. Figures for conventional sites are WaiMAP screening values and typical industry ranges. Data Renoversity is built on proven technology; emerging options are added when certified. The concept is protected; technical details are shared under NDA.