

US Data Center and Utility Flexibility Projects

EPRI DCFlex portfolio, other utility partnerships and their commercial readiness

Public evidence reviewed 4 October 2026 | US focused verified edition

Purpose and scope

This document reviews the publicly identified U.S. EPRI DCFlex demonstrations and selected additional data center projects with documented grid-flexibility features. It distinguishes live grid response, effective contracts, completed tests and development plans. International projects appear only in Part 5 as reference material.

Coverage is complete for the seven U.S. demonstration entries in EPRI's announced nine-entry portfolio. The broader U.S. inventory is an expanded public-source inventory, not a census of every utility-connected data center or confidential demand response enrollment. Inclusion in DCFlex indicates program participation; it does not establish that EPRI finances the project.

Counting rule. A project entry is not necessarily one physical facility: the Virginia-to-Chicago demonstration spans two locations. Utility programs, the ERCOT aggregate, laboratory validation and a vendor microgrid are counted separately. Site capacity, battery capacity and contracted or delivered flexible MW must not be added together.

Summary of findings

AI workload flexibility has reached live production in Santa Clara. NVIDIA reports recurring utility signals at Eos, while Google has an effective approved contract at its operating Fort Wayne site. These are early commercial examples under this report's definition; the evidence does not support a blanket statement that no U.S. AI flexibility arrangement is commercial. [V1, V2]

Microsoft's Cheyenne arrangement is an established tariff-based precedent using backup generation. ERCOT's mining-heavy flexible-load fleet is a separate market benchmark, not a single AI data center project. Neither establishes the current workload mix at Microsoft's facility. [V3]

Contracted flexibility is ahead of public dispatch evidence. Google reports an aggregate 1 GW across five utility agreements; Georgia Power reports up to 1,000 MW for OpenAI's planned Project Camellia. These commitments do not prove that those MW have been dispatched, and the five Google contracts are at different stages. [V4, V5]

Published examples range from a 256-GPU Phoenix test to a reported 1 MW reduction at Santa Clara. Manassas is a planned 96 MW facility, not a demonstrated 96 MW curtailment resource. Its scale and planned commissioning must be distinguished from delivered flexibility. [V1, V6]

Flexible interconnection, paid demand response and emergency interruptibility are different commercial mechanisms. Some projects seek earlier grid access; others receive participation credits or accept emergency curtailment. An approved rule is not evidence of an enrolled or dispatched data center. [V2, V7]

Coverage and counting

Record category	Entries	Boundary
US DCFlex map entries	7	All seven U.S. entries; excludes Paris and London.
Additional US data center project entries	18	Named sites or announced arrangements beyond the map; includes proposed and contracted projects.
Laboratory validation	1	Verrus at NREL, now NLR; not a utility-connected operating campus.
Vendor demonstration facility	1	Vertiv and CPower Ohio microgrid; not a customer data center deployment.
Market aggregate benchmark	1	ERCOT large flexible loads; not a site count.
Utility programs and policy frameworks	7	Separate from projects; approvals do not establish enrollment.

Total: 25 data center project entries, plus 10 separately identified laboratory, vendor, aggregate and policy records. The three-campus infrastructure watchlist below is excluded from these totals.

How commercial readiness is rated

Ratings describe public evidence as of 4 October 2026, not vendor certification. An effective contract at an operating facility may be early commercial without a published dispatch result. Contracted or approved does not mean commissioned, and demonstrated does not mean recurring service. Unknowns are stated as unknowns rather than as proof that an arrangement does not exist.

Level	Meaning
Commercial	Established tariff or market participation at an operating site; the public record supports an established arrangement, though recent dispatch data may remain unavailable.
Early commercial	Live pilot or effective flexibility contract at an operating site. Does not by itself establish measured dispatch under every obligation.

Level	Meaning
Contracted / approved	Signed arrangement or approved framework with flexibility commissioning or enrollment not confirmed; approvals may be conditional or pending.
Demonstrated	Completed field test with no continuing commercial arrangement established in the reviewed record.
Pre-commercial	Announced, proposed, simulated, under construction or pending approval, with no field result.
Not a grid service	A test that does not involve a utility calling on the data center.

Part 1 US EPRI DCFlex demonstration portfolio

EPRI announces nine demonstration entries: seven U.S. entries listed below, plus Paris and London in Part 5. Its longer-term target is at least ten demonstrations. Hillsboro has separately documented EPRI involvement and appears in Part 2; it is not added to EPRI's official map count. Workstream assignments below are analytical, not an official EPRI project matrix. [V8]

Project location	Primary test	Evidence level	Alignment	Commercial readiness
Phoenix, Arizona	IT workload flexibility	Completed field test; public paper	WS2 Programs	Demonstrated
Lenoir, North Carolina	IT workload flexibility	Active demonstration; no result published	WS2 Programs	Pre-commercial
Chicago, Illinois	IT workload flexibility	Completed, per Emerald AI; no result published	WS1 DC Design	Demonstrated
Dallas, Texas	HVO generator-based backup solution	Field test completed 6 May 2026	WS1 DC Design	Not a grid service
Ashburn, Virginia and Chicago, Illinois	Geospatial shifting and IT workload flexibility	Completed, per Emerald AI; megawatts not published	WS1 DC Design	Demonstrated
Manassas, Virginia	Load flexibility by design	Under construction; later-2026 target, no go-live confirmed	WS1 DC Design	Pre-commercial
Texas, location to be determined	Compute and HVAC load flexibility	Announced; no result published	WS1 DC Design	Pre-commercial

EPRI now lists five workstreams. WS1 Grid-Informed Flexible Data Center Designs develops flexible and efficient facilities and operations. WS2 Transformational Utility Programs develops program and market structures. WS3 Interconnection Practices addresses connection studies and practices. WS4 Planning and Portfolio Readiness addresses system planning. WS5 Distribution-Connected Data Centers addresses distribution-level integration. Projects can support more than one workstream; the table gives a primary interpretation only.

Project profiles

1 Phoenix, Arizona

USE CASE IT workload flexibility	UTILITY OR GRID PARTNER Salt River Project; NVIDIA also names Arizona Public Service	TECHNOLOGY PARTNERS Emerald AI, NVIDIA, Oracle
PUBLIC STATUS Completed field test; public paper	SCALE 256-GPU cluster; load in kW or MW not published	COMMERCIAL READINESS Demonstrated

Purpose. Test whether an AI compute cluster can reduce electricity demand during grid stress while preserving essential services and customer commitments.

Public evidence. NVIDIA reports a 25% reduction for three hours on 3 May 2025 using 256 GPUs at an Oracle facility during an SRP peak event, while maintaining service quality. A public field-trial paper is available; Emerald AI also reports publication in Nature Energy. The result concerns the test cluster, not the whole facility.

Readiness. Completed field demonstration. The reviewed sources do not establish ongoing utility enrollment, payment or repeat commercial dispatch.

2 Lenoir, North Carolina

USE CASE IT workload flexibility	UTILITY OR GRID PARTNER Duke Energy	TECHNOLOGY PARTNERS Google
PUBLIC STATUS Active demonstration; no result published	SCALE Not published	COMMERCIAL READINESS Pre-commercial

Purpose. Develop utility and data center operating and communication protocols, then test scheduling or shifting of computing workloads in response to grid needs.

Public evidence. EPRI says Google and Duke Energy are developing protocols that would give Duke confidence to rely on data center flexibility as a grid resource. No event result was found as of 4 October 2026.

Readiness. No Lenoir-specific flexibility tariff, recurring enrollment or dispatch result is established by the reviewed sources. This is not a finding that Duke has no demand response programs.

3 Chicago Illinois

USE CASE IT workload flexibility	UTILITY OR GRID PARTNER Constellation (a power supplier; the local wires utility is ComEd)	TECHNOLOGY PARTNERS Emerald AI, Oracle, NVIDIA
PUBLIC STATUS Completed, per Emerald AI; no result published	SCALE Not published	COMMERCIAL READINESS Demonstrated

Purpose. Validate real-time control of AI computing demand and examine how flexible computing can respond to power-system conditions.

Public evidence. EPRI describes the test as compute load flexibility with real-time power control "in a simulated production environment". Emerald AI listed Illinois among five completed demonstrations in August 2026. No quantitative result is public.

Readiness. Completion is reported by Emerald AI. Independent site metrics and continuing utility enrollment are not established.

4 Dallas Texas

USE CASE HVO generator-based backup solution	UTILITY OR GRID PARTNER None named	TECHNOLOGY PARTNERS Compass Datacenters (Cummins QSK60 engine)
PUBLIC STATUS Field test completed 6 May 2026	SCALE 2 MW backup generator	COMMERCIAL READINESS Not a grid service

Purpose. Compare hydrotreated vegetable oil with fossil diesel in a data center backup generator under real operating conditions.

Public evidence. EPRI describes a 6 May 2026 comparison of HVO and fossil diesel using a 2 MW Cummins QSK60 backup engine at Compass Datacenters, at 50% and 100% load. The public summary supports the test, equipment and methodology. Specific emissions reduction percentages are omitted pending verification in the underlying report.

Readiness. An equipment and emissions test. It involves no utility dispatch and no flexible computing.

5 Ashburn Virginia and Chicago Illinois

USE CASE Geospatial shifting and IT workload flexibility	UTILITY OR GRID PARTNER Constellation	TECHNOLOGY PARTNERS Emerald AI, Oracle, NVIDIA
PUBLIC STATUS Completed, per Emerald AI; megawatts not published	SCALE Not published	COMMERCIAL READINESS Demonstrated

Purpose. Test whether computing work can be moved between regions during grid congestion while meeting grid and customer requirements.

Public evidence. Emerald AI reports that inference work on Oracle cloud was shifted from Virginia to Chicago using NVIDIA's Dynamo framework, relieving winter peak load in Virginia while keeping latency low. Delivered megawatts are not public.

Readiness. Completed test. No tariff or market enrollment is public.

6 Manassas Virginia

USE CASE Load flexibility by design	UTILITY OR GRID PARTNER PJM named at announcement; Emerald AI named Dominion as a partner in August 2026. EPRI's map still shows TBD	TECHNOLOGY PARTNERS Digital Realty, NVIDIA, Emerald AI, EPRI
PUBLIC STATUS Under construction; later-2026 target	SCALE 96 MW Aurora AI Factory	COMMERCIAL READINESS Pre-commercial

Purpose. Build flexibility into a commercial-scale AI facility from the start and test AI computational flexibility at that scale.

Public evidence. EPRI lists a facility under construction. Emerald AI's Aurora announcement explicitly names testing through DCFlex; its August 2026 update names EPRI, Dominion and PJM and targets later in 2026. NVIDIA's September account still describes the dedicated DSX Flex deployment as future. Aurora and the Vera Rubin AI Factory Research Center are treated as the same announced 96 MW project. [V6]

Readiness. Planned commercial-scale facility and test. No commissioning announcement or delivered flexibility MW is established. Facility capacity is not the amount that can necessarily be curtailed.

7 Texas location to be determined

USE CASE Compute and HVAC load flexibility	UTILITY OR GRID PARTNER To be determined	TECHNOLOGY PARTNERS PADO AI
PUBLIC STATUS Announced; no result published	SCALE Not published	COMMERCIAL READINESS Pre-commercial

Purpose. Pair an AI platform that controls computing and cooling loads to provide a facility-level flexibility resource.

Public evidence. EPRI names the use case and PADO AI only. PADO said in March 2026 that it has three demonstrations with EPRI but named no sites, utilities or operators. PADO targets data centers below about 75 MW.

Readiness. No site, utility or completed event is public.

Part 2 Additional US projects and technology validation

This section distinguishes software-controlled workloads, signed flexibility arrangements and laboratory validation. EPRI involvement in an additional project does not automatically make it another entry on the published DCFlex map.

Emerald AI and NVIDIA

Project and grid party	What it is	Status and public evidence	Commercial readiness
Santa Clara, California: NVIDIA Eos Silicon Valley Power	Emerald Conductor runs in production at NVIDIA's Eos AI factory under Silicon Valley Power's Flexible Load Interconnection Program, which gives data centers expanded grid access in exchange for dispatchable flexibility.	Pilot announced 21 April 2026 at "multi-megawatt scale". NVIDIA reported in September 2026 that the utility had sent more than 200 signals and that Eos cut from 4 MW to 3 MW in under a minute on an August evening.	Early commercial Production software and reported repeated utility signals. Full DSX Flex installation is still future; detailed commercial terms are not public. [V1]
Hillsboro, Oregon Portland General Electric	Emerald software with the NVIDIA DSX stack on Grace Blackwell Ultra clusters. The host facility is not named in the sources reviewed.	Emerald reports completion in March 2026: 20% reduction in a cold scenario; over 25% for more than six hours on three reenacted heat-wave days; a 24-hour emergency scenario and response to CAISO price signals. These are test scenarios, not proof of 24-hour commercial dispatch.	Demonstrated Emerald calls it its largest demonstration. No enrollment in a utility program is public.

Emerald AI reported five completed demonstrations in August 2026 across Arizona, Illinois, Virginia, Oregon and London. London is retained in Part 5. Santa Clara is a separate live production deployment. Eos is NVIDIA's AI supercomputer and host facility; NVIDIA explicitly says this installation is not yet a full DSX Flex installation. [V1]

Google

Project and grid party	What it is	Status and public evidence	Commercial readiness
Omaha area, Nebraska Omaha Public Power District	Google reduced the power demand of machine-learning workloads during grid events.	Three grid events in 2024, reported by Google in August 2025.	Demonstrated Real utility events, but no standing contract is described.
The Dalles, Oregon Northern Wasco County PUD	Day-ahead demand response at Google's data center.	Pilot reported by Google in October 2023, with the utility confirming the capability was demonstrated.	Demonstrated Completed pilot; no continuing program is described.
Fort Wayne, Indiana Indiana Michigan Power	Customer-specific demand response and clean capacity arrangement covering Google's operating Fort Wayne data center.	IURC approved the contract on 29 April 2026. The site was energized in November 2024 and is operating. The order describes credits and compliance provisions; key quantitative terms remain confidential. No event result is established. [V2]	Early commercial An approved contract at an operating site, with no public dispatch record.
Tennessee Valley Tennessee Valley Authority	Demand response agreement for Google machine-learning workloads.	Announced August 2025. Participating sites, size and results are not public.	Contracted / approved Agreement announced; no operating detail.
West Memphis, Arkansas Entergy Arkansas	Special rate contract for a planned data center, with load flexibility provisions to reduce use during grid constraints.	Entergy confirms APSC approval on 29 January 2026 in docket 25-055-P. Google identifies demand response in the agreement. The site remains a future deployment; a commercial dispatch record is not established. [V17]	Contracted / approved Counted by Google among its contracts; the site is not yet in service.
Hermantown, Minnesota Minnesota Power	Electric service agreement for a planned data center, counted by Google among its demand response contracts.	Agreement filed 26 March 2026. The Minnesota PUC's current project page lists it as under review. Signed agreement, not confirmed regulatory approval or live flexibility. [V18]	Contracted / approved Signed but pending regulatory approval; no site operating.
Van Buren Township, Michigan DTE Energy	Contracts for a 1 GW data center. Google says the agreement includes demand flexibility alongside solar and storage.	Conditionally approved by the Michigan Public Service Commission on 1 October 2026. Service is expected in December 2027 and full load in December 2028. The commission's release does not describe the demand response terms.	Contracted / approved Approved contract for a future site.

Google's March 2026 announcement identifies 1 GW of aggregate contracted demand response across I&M, TVA, Entergy Arkansas, Minnesota Power and DTE. Site-specific allocations and delivered MW are not disclosed in that announcement. Google uses its own workload-management capabilities; the reviewed announcements do not identify Verrus software at these sites. Lenoir remains a separate demonstration entry. [V4]

Project and grid party	What it is	Status and public evidence	Commercial readiness
Effingham County Georgia OpenAI Project Camellia Georgia Power	Planned 3,200 MW facility with up to 1,000 MW of demand response under a 25-year agreement. Delivery is phased from 2028 to 2032. [V5]	Georgia Power announced the agreement in July 2026; August reporting records regulatory clearance. The specific software, event limits and reduction mechanism are not disclosed. No live deployment is established.	Contracted / approved The largest single flexibility commitment found. The site is not yet in service.
Golden Colorado Verrus laboratory validation NREL now NLR	ARIES virtual emulation of a 70 MW design, followed by digital-twin and controller-hardware-in-the-loop validation. The laboratory is not a utility partner or a commissioned 70 MW campus. [V9]	Verrus reported the first results on 9 June 2025, including modeled full grid-import curtailment within a minute. Its 7 May 2026 StabiliGrid update expressly describes testing before grid deployment.	Pre-commercial Laboratory validation only.
Salem, Oregon: Oakline at Mill Creek Portland General Electric	Proposed Verrus campus designed to reduce demand during utility system peaks.	Development and permitting remain unresolved. Salem reports a 31 July 2026 application and an incomplete-application notice on 28 August. A city moratorium and blocked state-land sale create schedule risk; these do not establish project cancellation. [V15]	Pre-commercial Proposed, with approval in doubt.
Lyon Township, Michigan: Project Flex DTE Electric is publicly associated	Proposed Verrus campus with flexible-demand and battery design.	Proposed campus with local conditional planning approval reported in July 2026. No commissioning or utility flexibility-service agreement is established in the reviewed record.	Pre-commercial Proposed; not yet built.

PADO AI reports three EPRI demonstrations, but the additional identities are not disclosed, so no extra sites are invented or counted. Verrus integrates storage, electrical controls and grid-aware operation. Its laboratory demonstrations and proposed campuses are distinct from Google's internal compute-flexibility deployments; a shared investor history is not evidence of a software deployment. [V9]

Part 3 Flexibility from batteries and on-site generation

These projects use batteries or on-site generation to reduce net grid demand while supporting computing. They illustrate established or proposed operating mechanisms; they do not establish that all data center flexibility is delivered this way. The ERCOT aggregate and Vertiv vendor test are explicitly separate from named commercial data center projects.

Project and grid party	What it is	Status and public evidence	Commercial readiness
Cheyenne, Wyoming: Microsoft Black Hills Energy	Black Hills Energy's Large Power Contract Service tariff combines market power procurement with customer-owned dispatchable backup generation. The utility may call on generation at peak demand. [V3]	Tariff approved in July 2016 and described by the utility as an established Microsoft partnership. Eligibility is over 13 MW. Recent event-level dispatch data is not established.	Commercial A standing tariff for about ten years. It relies on generation, not on flexible computing.
Texas: large flexible loads ERCOT	Mostly cryptocurrency mining sites that cut consumption when prices are high or the grid is stressed, through ERCOT demand response and reserve programs.	EIA reported 5,479 MW of approved large flexible load as of October 2024, mostly cryptocurrency mining. This is historical approved load, not current AI flexibility, actual simultaneous curtailment or a count of facilities.	Commercial Years of market participation at gigawatt scale. The evidence is for crypto mining, not AI data centers.
Memphis Tennessee xAI campus arrangements MLGW and TVA	MLGW confirms a signed TVA/xAI/MLGW agreement requiring grid consumption reductions at high demand. Backup generation and storage can support the response. [V12]	MLGW's 2025 update confirms the agreement for the Paul Lowry site. Separate September 2026 reporting estimates about 2.8 GWh at Colossus 2 from satellite imagery. Do not assign this estimate to Colossus 1 or treat it as independently verified usable capacity.	Early commercial Operating campus and utility-confirmed curtailment agreement; site-specific event performance remains unverified.
Hillsboro, Oregon: Aligned Data Centers Portland General Electric, with GridCARE and Calibrant Energy	31 MW / 62 MWh battery project with Calibrant, intended to accelerate Aligned's connection and support PGE's grid. PGE confirms the partnership. GridCARE's wider 80 MW capacity finding is not the battery's rating. [V13]	Announced October 2025 with a 2026 operating target; PGE described it in May 2026. EEI lists the project and grid-service purpose but does not explicitly confirm commissioning. No dated commissioning notice is established.	Contracted / approved Deployment agreement and utility participation confirmed; operational flexibility not independently established.
San José, California: Microsoft Pacific Gas and Electric	Microsoft San José project with Enchanted Rock generation intended for backup and grid services. The CEC record for 1657 Alviso-Milpitas Road is docket 19-SPPE-04. [V19]	EEI describes a 77 MW data center; CEC lists a 99 MW project and approved exemption. These figures describe different source scopes. Neither record establishes a date for grid-service commissioning or measured dispatch.	Contracted / approved Approved project and announced energy design; live grid-service operation unverified.

Project and grid party	What it is	Status and public evidence	Commercial readiness
Delaware, Ohio: Vertiv and CPower PJM, through CPower's virtual power plant	Vertiv's data center battery system integrated with CPower's platform so that data centers can offer storage as a grid resource.	CPower's 14 April 2026 announcement identifies revenue from a 1 MW microgrid at Vertiv's Ohio Customer Experience Center. It combines storage, solar, hydrogen fuel cell and UPS systems. No commercial customer data center is identified. [V20]	Demonstrated Shown at a vendor site; no data center customer yet.
Edison New Jersey Iron Mountain and Calibrant Regional utility not named	23 MWh on-site battery to integrate with an existing 7.2 MW solar installation and reduce peak grid demand.	Definitive build-own-operate agreement announced 19 February 2026. Utility dispatch contract, battery MW rating and commissioning are not disclosed. [V21]	Contracted / approved Private deployment agreement; utility-service qualification and go-live unverified.
Saline Township Michigan Oracle OpenAI Related Digital DTE Electric	1,383 MW planned campus with emergency load interruption ahead of other DTE customers. Separate 1,383 MW storage agreement funds utility-owned resources, not necessarily on-site batteries.	MPSC conditionally approved contracts on 18 December 2025, case U-21990. This is emergency interruptibility plus utility storage; it does not demonstrate software-controlled workload response. [V22]	Contracted / approved Regulatory conditions and future supply arrangement; no live dispatch established.

Related US infrastructure watchlist

Lancium's Abilene, Childress and Hall County campuses merit separate tracking. They are not additional EPRI map projects, and approved grid connections or an operating building alone do not demonstrate utility-dispatched AI flexibility. Abilene Texas. Lancium and Crusoe's 1.2 GW campus has energized initial buildings and hosts Stargate infrastructure. Current company materials describe energy orchestration and grid-supporting resources, but the reviewed record does not establish site-specific AI curtailment MW or a recurring utility dispatch record. [V25]

Childress Texas. Crusoe and Lancium announced a separate 1 GW campus in July 2026; Lancium reports an approved interconnect. Hall County Texas. QTS and Lancium separately announced a campus in July 2026. Both remain infrastructure pipeline entries here, pending site-specific flexibility-service evidence. [V25]

Part 4 Utility programs, tariffs and market rules

These seven entries are programs, rules or proposals, not seven additional data center deployments. Availability, approval and enrollment are separate milestones. SVP's program is described with its named Eos deployment in Part 2.

Program and authority	What it is	Status and public evidence	Commercial readiness
Flex Connect Pacific Gas and Electric (California)	Flexible distribution connection: customers connect sooner and accept limits during constrained hours until upgrades are built.	PG&E's current program materials call Flex Connect a pilot using controls to enforce flexible import limits. Customer activity is reported, but no named data center enrollment is established by those materials. [V14]	Early commercial program Operating pilot framework; not evidence of a live data center project.
Provisional Controllable Load Resource ERCOT and the Public Utility Commission of Texas	Loads of 75 MW or more accept ERCOT curtailment instructions in exchange for faster connection in the "Batch Zero" process. Separately, Senate Bill 6 (2025) requires large loads with backup generation to accept emergency curtailment.	PGRR145 approved 18 June 2026. ERCOT records 11 July 2026 effectiveness for Batch Zero and withdrawal-limited private-use networks; PCLR provisions take effect upon system implementation. Do not label PCLR dispatch live on 10 July. [V7]	Approved framework Implementation differs by provision; no named live PCLR site verified.
Conditional High Impact Large Load Service Southwest Power Pool	Non-firm transmission service for large loads for up to seven years while they wait for firm service. The grid operator can curtail it during constraints or emergencies.	FERC accepted CHILLS on 5 June 2026 as non-firm service while sufficient resources or network upgrades are pending. No named participating data center is established. [V11]	Contracted / approved Approved; no public enrollment.
Interim Resource Adequacy Service PJM Interconnection	Proposal that new loads of 50 MW or more that do not bring their own new capacity are curtailed before other pre-emergency measures.	PJM's large-load page identifies IRAS and the large-load registry under docket ER26-3515 as pending FERC approval. Future registry and service dates are implementation proposals, not operating enrollments. [V10]	Pre-commercial Pending federal approval.
Large Load Demand Flexibility Program Dominion Energy Virginia	Program required by 2026 Virginia law (House Bill 284 and Senate Bill 371) for large-load customers to adjust use under set conditions.	Stakeholder work began July 2026. Filing with the State Corporation Commission is planned for January 2027, with a final order expected by 30 November 2027.	Pre-commercial In design; terms and incentives are not set.
Large-load tariff with interruptible option Xcel Energy (Minnesota)	A large-load tariff with a 15-year minimum term. DSIRE Insight reports an optional interruptible rate for customers of 100 MW or more with at least 3 MW of controllable load.	Large-load tariff approved by the Minnesota Public Utilities Commission on 15 May 2026. No enrollment is public.	Contracted / approved Approved; no public enrollment.
Model large-load tariff Pennsylvania Public Utility Commission	Guidance for utilities serving loads above 50 MW, or 100 MW in aggregate.	Final order issued May 2026. It is nonbinding and relies on utilities' existing interruptible tariffs instead of creating a new non-firm service.	Pre-commercial Guidance only; no new flexible service.

Policy context

- Federal emergency authority. PJM's filing archive records temporary DOE authority to use backup generation during 2026 emergencies. Temporary emergency powers are policy context, not proof that a named data center was dispatched or enrolled in a standing flexibility program. [V28]
- Federal review. FERC's June 2026 large-load proceedings address interconnection and reliability frameworks. They should not be counted as site deployments. [V11]
- Industry coordination. Industry alliances and EPRI frameworks support standards and policy development. Membership alone does not identify an operating project or establish flexible MW.

Part 5 Reference projects outside the United States

International benchmarks are excluded from U.S. counts. Paris and London remain part of EPRI's nine-entry portfolio and are profiled here. The other examples cover compute scheduling, batteries and generation; their mechanisms and scales differ.

Paris France DCFlex reference

USE CASE Power-quality fault ride-through	UTILITY OR GRID PARTNER RTE	TECHNOLOGY PARTNERS Schneider Electric, Data4
PUBLIC STATUS Active demonstration; no result published	SCALE Not published	COMMERCIAL READINESS Pre-commercial

Purpose. Evaluate how a data center and its electrical systems respond to voltage and frequency disturbances.

Public evidence. EPRI lists fault ride-through as the use case. No field result is public.

Readiness. Outside the United States, and a power-quality test, not a flexible-computing arrangement.

London United Kingdom DCFlex reference

USE CASE IT workload flexibility	UTILITY OR GRID PARTNER National Grid	TECHNOLOGY PARTNERS Emerald AI, Nebius, NVIDIA
PUBLIC STATUS Completed live-site trial	SCALE 96 NVIDIA Blackwell Ultra GPUs	COMMERCIAL READINESS Demonstrated

Purpose. Show that AI infrastructure can respond to day-ahead, hour-ahead and real-time curtailment requests without disrupting priority workloads.

Public evidence. A five-day trial in December 2025 ran more than 200 simulated grid events. The cluster cut demand by up to 40%, shed 30% in about 30 seconds and followed reduction requests for up to 10 hours.

Readiness. Outside the United States. Events were simulated and the cluster was small.

Project and grid party	What it is	Status and public evidence	Commercial readiness
Belgium: Google Elia, with Centrica Energy	Google shifts non-urgent computing when the Belgian system needs relief.	Described by Google in August 2025 as ongoing. No dispatch data is public.	Early commercial Ongoing arrangement without public results.
Taiwan: Google Taiwan Power Company	Daily peak-hour reductions in data center power use.	Carried out in the summers of 2022 and 2023; described by Google as ongoing.	Early commercial Repeated seasonal use; terms not public.
Dublin, Ireland: Microsoft EirGrid, through Enel X	Grid-interactive UPS batteries that provide grid services.	Certified, tested and approved for grid connection in July 2022, with operation expected later that year. Later operation was not re-checked.	Early commercial Approved and connected; operating record not re-checked.
Ireland: Digital Realty, nine data centers EirGrid, through Enel X	UPS batteries provide frequency response under the DS3 program.	Active participant, per the Enel X case study.	Commercial Operating in an established grid-services market.
Finland: Aurora DC Nordic reserve market, with Eaton	A 400 kW UPS system in the FCR-N reserve market.	Deployed in 2019; Eaton calls it the first commercial deployment of its grid-interactive UPS.	Commercial Commercial since 2019, at small scale.
Norway: Basefarm Statnett, with Fortum and Eaton	UPS capacity in the Fast Frequency Response market.	Pilot followed by 800 kW of market participation from the 2020 season, with revenue reported.	Commercial Paid market participation, at small scale.
Suwon, South Korea: Samsung SDS Enel X Korea	The data center curtails grid load on dispatch notice, using on-site generation.	Active participant earning program revenue.	Commercial Operating program; relies on on-site generation.
Belgium Google battery reference Elia with Centrica and Fluence	Battery-backed grid services, separate from Google compute scheduling.	Centrica's 2022 announcement describes 2.75 MW / 5.5 MWh installed storage, with 2.75 MWh optimized for grid services. [V23]	International reference Battery project; MW and MWh are distinct.
Netherlands Google Eneco	Compute demand reduction supporting the Dutch grid.	Google's October 2023 account reports the pilot and daily European evening reductions during winter 2022 to 2023. [V24]	Demonstrated Historical reference; ongoing enrollment not established here.

Commercial readiness findings

Commercial terms are partly public. The IURC's Fort Wayne order discusses demand response credits, qualification, curtailment and nonperformance provisions, while keeping important quantitative terms confidential. It is inaccurate to say no Google arrangement discloses commercial mechanisms. Public reporting remains insufficient to compare realized performance across all sites. [V2]

Scale requires consistent measurement. GPU counts, whole-site electrical demand, battery discharge power and contracted flexible MW measure different things. The 96 MW Manassas nameplate and the 70 MW Verrus laboratory model cannot be treated as delivered utility curtailment. [V6, V9]

Commissioning and dispatch need separate evidence. Google's portfolio includes an operating Fort Wayne facility and future sites. OpenAI's Georgia project has phased service planned for 2028 to 2032. Contract announcements establish a pipeline, not a combined live 2 GW flexibility resource. [V2, V4, V5]

Operating evidence is strongest when the mechanism and event are both identified. Santa Clara has reported automated compute response; Cheyenne has an established generation-backed tariff; xAI has a utility-confirmed curtailment agreement. Aligned Hillsboro and Microsoft San José require clearer commissioning and dispatch evidence before being labelled operational flexibility resources. [V1, V3, V12, V13]

Ready to deploy is site-dependent. A validated product still requires utility agreement, controls integration, commissioning and performance qualification. ERCOT's approved Batch Zero provisions have a different implementation timetable from PCLR dispatch functionality. PG&E continues to describe Flex Connect as a pilot. [V7, V14]

Local permissions remain separate from grid readiness. Salem's application and moratorium process and Texas's September 2026 permit pause can affect schedules. They do not establish technology failure or cancellation of every project. [V15, V16]

Verification corrections and additions

- Scope and count. Retained all seven U.S. DCFlex map entries; moved the Paris and London profiles into international references. Separated the project inventory from seven utility-policy entries, one market aggregate and two validation facilities.
- Additional projects. Added Iron Mountain and Calibrant in Edison, New Jersey, and Oracle/OpenAI/Related Digital with DTE in Saline Township, Michigan. A separate infrastructure watchlist identifies Lancium's Abilene, Childress and Hall County campuses without asserting unverified AI dispatch.
- Commerciality. Replaced the categorical claim that no U.S. AI flexibility is commercial with evidence-based descriptions of Santa Clara and Fort Wayne. Removed the unsupported inference that Cheyenne's current workloads contain no AI.
- Readiness corrections. Aligned Hillsboro and Microsoft San José are retained as contracted or approved projects with commissioning and grid-service activation unverified; EEL's directory is not a commissioning certificate.
- Google. Confirmed the Arkansas special-rate approval dated 29 January 2026 using Entergy's regulatory record. Corrected the statement that Google discloses no payment or nonperformance mechanisms.
- xAI. Added MLGW's direct confirmation of a signed curtailment agreement. Separated that evidence from the reported Colossus 2 battery estimate and avoided treating all Memphis campuses as one measured asset.
- Manassas. Retained the Aurora overlap based on the explicit DCFlex announcement. Clarified that 96 MW describes planned facility capacity, not measured demand reduction.
- ERCOT. Corrected Batch Zero and withdrawal-limited-network effectiveness to 11 July 2026 in PGRR145; PCLR provisions depend on system implementation.
- Verrus. Corrected the laboratory description to virtual emulation and controller testing. The 70 MW model is not a live 70 MW data center.
- PG&E. Used the utility's current pilot description and avoided assuming data center participation merely from a pipeline of prospective customers.
- Vertiv and CPower. Retained the revenue-earning 1 MW Ohio microgrid as a vendor validation site, not a named commercial data center customer deployment.
- Evidence language. Replaced unsupported universal statements such as no tariff exists or first test at scale with bounded findings from the reviewed announcements.
- International references. Added the omitted Google Netherlands/Eneco example and distinguished Google Belgium compute flexibility from its separately announced battery project.

Source notes and limitations

- Source strength. EPRI, utility, regulator, operator and vendor publications support the principal findings. Vendor performance claims are attributed; a project announcement is not independent validation of performance.
- Open milestones. Commissioning and grid-service activation remain unverified for Aligned Hillsboro and Microsoft San José. The Iron Mountain announcement does not identify a utility dispatch contract or confirm commissioning.
- Different reporting standards. A utility pilot can run production software. Conversely, an operating building can have future flexibility obligations. The report rates the flexibility arrangement and gives its evidence separately.
- Completeness boundary. Confidential projects, unnamed PADO demonstrations and unannounced utility enrollments cannot be enumerated. The wider U.S. inventory is selected coverage; ordinary power-supply agreements without a documented flexibility mechanism are outside the main list.

- Reference limits. International entries are contextual benchmarks rather than a new exhaustive international survey. Historic deployment dates should not be read as confirmation of every asset's current availability.
- Ratings are analytical judgments for this report, not EPRI or utility classifications. Lack of public dispatch data is not proof that no dispatch occurred.

Sources

EPRI DCFlex and the nine-site portfolio

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- [DCFlex Demonstration Map](#) Locations, use cases, utilities and partners.
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- [EPRI Journal: Flexible Loads, Resilient Grids](#) Phoenix, Lenoir and Paris context.
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- [Canary Media: North Carolina load flexibility](#) Duke Energy's position at the October 2025 conference.
- [PADO AI interview](#) Three EPRI demonstrations claimed; sites not named.

Emerald AI and NVIDIA

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- [NVIDIA case study: Emerald AI](#) Phoenix date and utilities; London results.
- [Emerald AI: DSX Flex demonstrations](#) Hillsboro results and the Virginia to Chicago shift.
- [Emerald AI: first DSX Flex deployment](#) Silicon Valley Power program and the Texas fast track.
- [Emerald AI: Series A](#) Five completed demonstrations; partners named.
- [Emerald AI: Aurora announcement](#) 96 MW Manassas facility, partners and original opening target.
- [Latitude Media: Aurora AI Factory](#) EPRI DCFlex testing role.
- [Silicon Valley Power pilot announcement](#) April 2026 pilot scope.
- [NVIDIA: Eos and Silicon Valley Power](#) More than 200 signals; 4 MW to 3 MW.
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- [ERCOT provisional controllable load rule](#) Earlier secondary summary; use V7 for corrected implementation dates.
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- [V3] Black Hills Energy Microsoft tariff case study
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