MCP SERVER | NO CODE | CLOUD HOSTED

EIA Electricity — Power Grid Intelligence MCP for AI Agents

Analyze U.S. electric demand, pricing, and generation flows by state.

EIA Electricity — Power Grid Intelligence delivers real-time, historical data across the entire U.S. power grid. It gives you hourly demand figures by balancing authority, tracks generation mix from coal and wind through nuclear sources, and provides retail electricity pricing by state. Plus, it inventories over 100,000 operational generators.

A+ Quality Score 100/100

power-grid | electricity-demand | energy-generation | utility-pricing | infrastructure-inventory | real-time-grid

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vinkius.com/mcp/eia-electricity-power-grid-intelligence

SCAN TO VIEW

The connectivity layer between AI and the world's software.

Vinkius sits between AI and every application. All communication passes through Vinkius Cloud via the Model Context Protocol (MCP) — with governance, observability, and security at every layer.

Your AI Connections Run Through Vinkius Cloud

The world's largest managed MCP catalog

Vinkius is the connectivity layer where AI connects to the software your business already runs. We handle the hosting, the security, the credentials, the uptime — you get agents that actually do things.

We operate the world's largest managed MCP catalog. Major SaaS platforms, CRMs, databases, and cloud providers — running, monitored, production-ready. This MCP server is hosted and maintained by the Vinkius Cloud for AI Agents.

> *The agent doesn't manage credentials, doesn't manage uptime, doesn't manage security. Vinkius does.*
>
> — Architecture principle

Four Pillars of the Vinkius Runtime

01 — Security by design

Credentials stay encrypted at rest via AES-256. The AI agent never touches raw keys — they're injected into a sandboxed V8 isolate at runtime. Actions are logged, and connections have an emergency kill switch.

02 — Built on MCP Fusion

This MCP server was built with **MCP Fusion**, the open-source framework (Apache 2.0) that powers the entire Vinkius catalog. Schema-as-firewall strips undeclared fields, compiled PII redaction runs at zero overhead, and cryptographic lockfiles produce git-diffable audit trails.

03 — Deterministic observability

Eight immutable metrics per endpoint: request volume, p95 latency, error rate, active connections, cost attribution. A live payload feed logs every tool call with mutation detection.

04 — Autonomous operations

Servers are deployed, monitored, and patched autonomously. New capabilities and security patches ship weekly. Zero-downtime deployments ensure continuous availability across all managed MCP servers.

AES-256	Ed25519	24h TTL	V8 Isolate
Encryption at rest	PKI vault signatures	Ephemeral session keys	Sandboxed execution

One Token. Instant Access.

Every MCP server on Vinkius is accessed through a **Connection Token**. Tokens are generated in the cloud dashboard and produce a unique MCP endpoint URL. Paste this URL into any MCP-compatible client — no SDK required.

A single token can serve **multiple AI clients simultaneously**, or you can issue separate tokens per client for granular access control. Each token tracks its own request count, last activity timestamp, and can be individually enabled or revoked.

MCP ENDPOINT

```
https://edge.vinkius.com/{token}/mcp
```

Claude · Cursor · VS Code · Windsurf · Grok · Gemini

Security Is the Architecture

Security in Vinkius is not a feature — it's the foundation of the runtime. The gateway enforces multiple independent protection layers between AI agents and third-party APIs.

01 — Ed25519 PKI Vault

Every workspace has an Ed25519 Master Key. Session keys are generated ephemerally (24h TTL) and signed by the Master Key. Credentials never leave the vault boundary.

02 — V8 Isolate Sandboxing

Tool code runs inside isolated-vm V8 isolates with 64 MB memory caps and per-request timeouts. No filesystem access, no network access except through the SSRF-guarded fetch bridge.

03 — SSRF Guard

All outbound HTTP requests are DNS-resolved and validated before execution. Private IP ranges (10.x, 172.16-31.x, 192.168.x, AWS metadata 169.254.x) are blocked at the network layer.

04 — DLP & PII Redaction

A ResponseGuard pipeline intercepts every tool response. Configurable redaction patterns strip sensitive fields (emails, SSNs, card numbers) before data reaches the AI agent.

05 — Cryptographic Audit Trail

Every request is signed into a SHA-256 hash chain with Ed25519 signatures. Events form a tamper-proof, SIEM-exportable forensic record.

06 — Honeytoken Trap System

Phantom credentials are injected into isolated environments. If a honeytoken is used outside Vinkius infrastructure, the server is quarantined instantly.

Emergency Kill Switch

EU AI Act Art. 14(1) Compliant

The kill switch is an **emergency halt** mechanism — not a simple toggle. When triggered, it executes three actions atomically:

01 — Server deactivated

The MCP server is immediately taken offline across the entire cluster.

02 — All tokens revoked

Every connection token is invalidated. Total lockout — reconnection blocked until new tokens are issued.

03 — WebSocket connections killed

Active connections terminated via Redis pubsub broadcast. Propagates to every runtime node in the cluster.

Full Visibility. Zero Guesswork.

The Vinkius cloud dashboard includes a full MCP Governance suite — real-time analytics and security controls for production AI operations.

Control Plane

KPI dashboard with request volume, latency, success rate, token consumption, and AI-generated operational briefings.

Agent Activity

Which AI clients are connecting, how often, and what they're doing — real-time session tracking.

FinOps

Cost tracking per tool, payload compression savings, budget optimization signals, and consumption trends.

Tool Health

Slowest and most error-prone tools, with actionable root-cause insights and performance baselines.

Firewall & DLP

PII redaction activity, sensitive data protection counters, and security event timeline.

Incident Log

Error trends, failure rates, status-code breakdowns, and forensic audit trail access.

> Get started at **cloud.vinkius.com** — connect your AI agent in under 60 seconds.

EIA Electricity — Power Grid Intelligence MCP

6 tools available
Cloud-hosted on Vinkius

This MCP gives your AI client a full picture of the U.S. energy landscape. You can run complex queries that pull together current grid demand figures with historical generation data to model supply-demand shocks. Need to know what a specific state's power prices look like across residential and industrial sectors? It’s there, linked directly to the fuel source mix for every major plant. Instead of manually visiting multiple government sites and compiling spreadsheets, your agent handles all that heavy lifting. You get immediate access to everything from individual plant fuel consumption details to comprehensive state profiles—all centralized through Vinkius, the #1 MCP catalog.

Core Capabilities

01 — Determine hourly grid demand

The tool retrieves real-time and historical electric grid demand figures for major U.S. balancing authorities.

02 — Analyze generation mix by fuel source

It calculates the amount of electrical power generated across various states, segmented by fuel type like coal, gas, or solar.

03 — Check retail electricity pricing

You can get current commercial and residential electricity rates for specific states and economic sectors.

04 — List all operable generators

The MCP provides a comprehensive inventory of every functional power generator across the United States, detailing its capacity and fuel source.

05 — Track specific plant operations

It delivers deep operational metrics for individual power plants, including net generation amounts and fuel consumption rates.

One Click on Vinkius — From Prompt to Execution

Available at **vinkius.com/mcp/eia-electricity-power-grid-intelligence** — connect your AI agent in three steps.

01 Your agent first identifies the necessary data points, like a specific state's electricity price or the date range for grid demand.

02 The MCP then calls the appropriate tool to pull raw data from EIA sources, compiling metrics on generation mix and plant operations.

03 Finally, your AI client synthesizes this complex information into a clear report showing the correlation between fuel usage, current demand, and pricing.

The bottom line is: you get immediate, cross-referenced data from multiple federal sources without writing any code or navigating confusing government websites.

Built For

Energy traders need this when they must make rapid decisions based on shifting regional power prices. ESG analysts require it to build robust reports tracking renewable energy adoption and carbon footprints across states. Grid operators use it daily to model load balancing and infrastructure developers rely on it for site capacity planning.

Energy Trader

Makes rapid buy/sell decisions by comparing real-time retail electricity prices in different states against projected grid demand.

ESG Analyst

Builds reports showing the historical percentage of renewable sources (solar, wind) contributing to state power generation mixes.

Utility Planner/Engineer

Models future infrastructure needs by comparing total operable generator capacity against projected regional load increases.

What Changes When You Connect

01 Know the real-time market cost of electricity. Use get_electricity_prices to compare commercial versus residential rates across any two states instantly.

02 Model future energy resilience. By running get_generator_inventory against get_grid_demand, you can identify single points of failure in a region's power supply.

03 Understand the source of power. Run get_power_generation to see exactly how much electricity is coming from coal versus wind in any given state.

04 See plant-level performance. Use get_plant_generation for deep dives into specific facilities, tracking fuel consumption and net generation rates.

05 Get a quick snapshot. The get_state_electricity_profiles tool gives you an immediate overview of all the key data points for a whole state's energy sector.

Real-World Applications

Assessing interstate pricing risk

A commodity trader needs to know if Texas rates are favorable compared to California. They ask their agent, which uses get_electricity_prices to pull both states' commercial rates and compares the difference directly.

Building a carbon footprint model

An ESG analyst wants to track how much renewable energy is actually contributing to grid stability. They use get_power_generation, cross-referencing wind and solar output against historical demand figures.

Evaluating infrastructure investment risk

A developer must decide where to build a new facility. They ask the agent to run get_state_electricity_profiles for several states, checking not only current demand but also the existing generator inventory capacity.

Simulating peak load failures

A utility planner needs to stress-test a region. They compare the maximum hourly grid demand from get_grid_demand against the total available power generation listed by get_power_generation to find potential shortfalls.

Patterns to Avoid

Mixing data sources manually

✗ AVOID

A user pulls state-level pricing from one site, then downloads generator capacity from another. They spend hours trying to match up the dates and regions, leading to inaccurate reports.

✓ INSTEAD

Let your agent use get_electricity_prices and get_generator_inventory in a single prompt. The MCP handles the data reconciliation across multiple federal sources, giving you one cohesive dataset.

Ignoring plant specifics

✗ AVOID

A user only reviews high-level state profiles (get_state_electricity_profiles) and assumes all plants are running at full capacity, missing localized supply constraints.

✓ INSTEAD

Ask your agent to use get_plant_generation. This tool provides the specific net generation and fuel consumption data needed to verify actual operating status.

Overlooking regional variation

✗ AVOID

Assuming that high demand in one area automatically means available power, without checking local grid constraints.

✓ INSTEAD

Always check get_grid_demand first. This tool provides the crucial hourly and daily load data for specific balancing authorities before you plan any major energy deployment.

The Right Fit

Use this MCP if your work requires connecting several distinct, highly technical datasets: state pricing, real-time demand, fuel composition, and physical asset inventory. It’s perfect for modeling complex systems. Don't use it if you only need basic market data, like a single stock price or general economic forecasts; those are better handled by financial feed MCPs. If your goal is simple comparison—for instance, comparing the name of two states—you don't need this. But when you need to know *why* one state has cheaper power (because its natural gas generation mix is higher), this MCP delivers that depth.

EIA Electricity — Power Grid Intelligence: Analyzing U.S. Energy Supply Mix

Before, determining the true source of a state's electricity was a headache. You had to piece together reports: one document for total demand, another for generation by fuel type (coal vs. gas), and yet another for current pricing. It meant downloading multiple spreadsheets and manually cross-referencing dates and regions just to get a basic understanding of the power mix.

Now, your agent handles that complexity. You ask it to analyze the state's overall energy picture, pulling together data from every major source—the total generation output, the fuel breakdown, and even individual plant details. You don't just get numbers; you get a narrative explaining the grid's current composition.

EIA Electricity — Power Grid Intelligence: Modeling Demand and Pricing Shifts

Calculating localized risk used to be a multi-step, slow process. You'd check the peak demand using one tool, then look up current pricing by sector in another, hoping they covered the same timeframe and geographic area. If you missed even one data point, your entire model was flawed.

With this MCP, you can run comparative analyses instantly. For example, comparing California's residential rates against Texas's commercial rates while simultaneously factoring in the current hourly grid demand gives you actionable intelligence that saves days of manual research.

EIA Electricity — Power Grid Intelligence MCP: 6 Tools for Energy Analysis

Use these tools to pull everything from current state electricity prices to detailed operational metrics of individual power plants and the entire national generator inventory.

#	TOOL	DESCRIPTION
01	`get_electricity_prices`	Retrieves current retail electricity prices, broken down by state and commercial or residential sector.
02	`get_power_generation`	Provides the total electric power generation output for a specific state, segmented by fuel source (e.g., natural gas, coal).
03	`get_grid_demand`	Fetches real-time and daily electric grid demand figures covering all major U.S. balancing authorities.
04	`get_state_electricity_profiles`	Gathers broad, high-level data sets that summarize the overall electricity profile for any given state.
05	`get_generator_inventory`	Lists the capacity and fuel source details for every single operable power generator in the nation.
06	`get_plant_generation`	Details individual plant operations, including net generation (MWh) and specific fuel consumption rates.

See It in Action

Real prompts you can use once this MCP is connected to your AI agent through Vinkius Cloud.

U How does the retail electricity price in Florida compare to Georgia for industrial users right now?

Retail Electricity Prices Comparison

STATE	SECTOR	PRICE (¢/KWH)
FL	Industrial	12.5¢
GA	Industrial	9.8¢

Georgia's industrial electricity rate is about 27% cheaper than Florida's current offering.

U What was the overall U.S. generation mix last month, and how much did natural gas contribute?

U.S. Generation Mix (Last Reporting Period)

- Natural Gas: 45.1%
- Nuclear: 18.9%
- Coal: 12.3%
- Wind: 10.5%
- Solar: 3.2%
- Hydro: 6.0%

Natural gas remained the dominant source, accounting for almost half of all electricity generated nationwide.

Frequently Asked Questions

01 **Can EIA Electricity — Power Grid Intelligence help me compare power prices between states?**

Yes. You can use this MCP to pull current retail electricity pricing for multiple states and sectors (residential, commercial, industrial) to see which area offers the best rates.

02 **I need to know how much power is generated by wind vs coal in a specific state.**

This MCP can provide that detail. It gives you generation mix data for any state, allowing you to track exactly what percentage of the grid's total output comes from different fuel sources.

03 **How do I check if enough power plants are available in a region?**

You can view the national generator inventory. This tool lists over 100,000 operable generators and their capacities, helping you assess overall regional supply strength.

04 **Does EIA Electricity — Power Grid Intelligence track real-time demand?**

Yes, it tracks grid demand. You can get the latest hourly and daily electricity load figures for major U.S. balancing authorities to model current stress points on the system.

05 **What is the difference between general state data and specific plant data?**

General profiles offer an overview of a whole state's energy sector. For deep analysis, use the tool that provides individual power plant operations, which details fuel consumption and net generation rates for single facilities.

Go Live in 60 Seconds

Get your connection token from **cloud.vinkius.com**, then paste the endpoint URL into any MCP-compatible client.

YOUR MCP ENDPOINT

```
https://edge.vinkius.com/[TOKEN]/mcp
```

CLIENT	WHERE TO CONFIGURE
Claude AI	Profile → Customize → Connectors → "+" → Add custom connector → Paste endpoint
Cursor	Settings → Features → MCP Servers → "+ Add New MCP Server" → Type: SSE → Paste endpoint
VS Code	Ctrl/Cmd+Shift+P → "MCP: Add Server" → add `"eia-electricity-power-grid-intelligence": { "url": "…" }`
Windsurf	MCP Settings → `mcp_settings.json` → Add endpoint URL
ChatGPT	Settings → Tools & plugins → Add MCP server → Paste endpoint
Gemini	Extensions → Add MCP Server → Paste endpoint URL

ASK AN AI ABOUT THIS

Let your preferred AI explain this MCP server

- Ask ChatGPT
- Ask Claude
- Ask Perplexity
- Ask Gemini
- Ask Grok

READY TO CONNECT

EIA Electricity — Power Grid Intelligence is live on Vinkius Cloud.

Get your connection token, paste it into your AI agent, and start building. No SDK. No deployment. Just results.

Start at cloud.vinkius.com →

vinkius.com · support@vinkius.com

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