MCP SERVER | NO CODE | CLOUD HOSTED

CO2 Emission Tracker MCP

Quantify carbon footprints and production intensity for energy operations.

CO2 Emission Tracker MCP provides specialized tools for quantifying carbon dioxide emissions in the oil and gas sector. It uses IPCC-aligned emission factors to convert fuel consumption, process venting, and flaring into precise mass units of CO2. You can calculate Scope 1, 2, and 3 emissions or determine your net carbon footprint by accounting for sequestration credits.

A+ Quality Score 100/100

carbon-footprint | emissions | oil-and-gas | ipcc | scope-1 | scope-2

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vinkius.com/en/ai-agent-connect/co2-emission-tracker

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.

CO2 Emission Tracker MCP

5 tools available
Cloud-hosted on Vinkius

This MCP gives your AI client the math engine needed to handle complex carbon accounting for oil and gas operations. Instead of manually converting fuel volumes or venting data, you let your agent handle the heavy lifting using IPCC-aligned emission factors. You can calculate direct Scope 1 emissions from flaring and venting, or look at indirect Scope 2 and 3 emissions across your entire value chain. If you need to see how efficient your production is, the MCP calculates emission intensity relative to your output. You can also find your total net carbon footprint by applying credits for CO2 reinjection. It turns raw operational data into standardized reporting metrics that follow international standards.

Core Capabilities

01 — Scope 1, 2, and 3 Accounting

Your agent uses these tools to categorize emissions into direct and indirect streams.

02 — IPCC Factor Conversion

The MCP converts fuel and venting data into CO2 mass units using standard factors.

03 — Net Footprint Calculation

Your agent applies sequestration credits to find the final net carbon impact.

04 — Production Efficiency Metrics

The MCP calculates how much CO2 is emitted per barrel or unit produced.

One Click on Vinkius — From Prompt to Execution

Available at **vinkius.com/en/ai-agent-connect/co2-emission-tracker** — connect your AI agent in three steps.

01 Connect your MCP-compatible client to Vinkius.

02 Provide your operational data like fuel use or venting volumes to your agent.

03 The agent calls the specific calculation tool needed for your task.

04 The MCP processes the data using IPCC-aligned factors.

05 Your agent delivers the final CO2 mass or intensity metric.

Connect your client to Vinkius and start running carbon math immediately.

Built For

This MCP is built for professionals managing environmental compliance and operational efficiency in the energy sector.

Sustainability Officers

They hand off raw emission data to the agent to generate standardized Scope reports.

Operations Managers

They use the agent to monitor emission intensity and production efficiency in real time.

Environmental Engineers

They use the tool to convert venting and flaring data into mass units for regulatory filings.

What Changes When You Connect

01 Standardizes emission calculations using IPCC-aligned factors.

02 Automates the conversion of fuel and venting data into CO2 mass.

03	Accounts for sequestration credits to provide net footprint totals.
04	Provides direct emission intensity metrics for production monitoring.

Real-World Applications

Regulatory Reporting

Generate Scope 1, 2, and 3 data required for environmental compliance filings.

Operational Benchmarking

Compare emission intensity across different production sites to find inefficiencies.

Carbon Credit Management

Calculate the impact of CO2 reinjection on your total net carbon footprint.

Value Chain Analysis

Assess the indirect emissions from purchased energy and supply chain activities.

Patterns to Avoid

Manual conversion errors

AVOID

You try to manually calculate CO2 mass from fuel volumes using a spreadsheet. This leads to inconsistent reporting and math mistakes.

✓ INSTEAD

Let your agent handle the math directly. Use `calculate_scope_1_emissions` to turn fuel and venting data into accurate mass units.

Ignoring sequestration credits

AVOID

You report your total gross emissions without accounting for the CO2 you reinjected back into the ground.

✓ INSTEAD

Get a true picture of your impact. Use `calculate_net_carbon_footprint` to apply sequestration credits to your totals.

Missing production efficiency trends

AVOID

You look at total emissions in a vacuum without knowing if your output per barrel is actually improving.

✓ INSTEAD

Connect your production volume to your emission data. Use `calculate_emission_intensity` to track efficiency over time.

The Right Fit

Energy sector professionals managing environmental compliance should connect this MCP. If you are just doing general carbon footprinting for a small office, you don't need this. The decision depends on whether you need to convert specific oil and gas operational data like flaring and venting into IPCC-aligned metrics.

CO2 Emission Tracker: 5 Specialized Accounting Tools

These tools handle the heavy lifting of carbon math, converting raw fuel and venting data into standardized emission metrics.

#	TOOL	DESCRIPTION
01	`calculate_emission_intensity`	This tool calculates your carbon emission intensity based on production volume. It shows how much CO2 is produced per unit of output.
02	`calculate_scope_1_emissions`	Use this to find total direct Scope 1 emissions. It processes data from fuel use, process venting, and flaring.
03	`calculate_net_carbon_footprint`	This tool determines your total net carbon footprint. It accounts for sequestration and CO2 reinjection credits.
04	`calculate_scope_2_emissions`	This tool calculates indirect Scope 2 emissions. It focuses on emissions from purchased energy.
05	`calculate_scope_3_emissions`	Use this to calculate indirect Scope 3 emissions. It covers emissions from your entire value chain.

See It in Action

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

U What are my total direct Scope 1 emissions if I used 500 units of fuel, had 50 units of process venting, and 20 units of flaring?

The total direct Scope 1 emissions are 450.5 kg of CO2.

U Calculate my net carbon footprint with Scope 1 of 1000, Scope 2 of 500, Scope 3 of 300, and 200 units of CO2 reinjection.

Your gross emissions are 1800 and your net emissions are 1600.

U What is the emission intensity for a net footprint of 5000 and a production volume of 10000 barrels?

The emission intensity is 0.5 units of CO2 per barrel.

Frequently Asked Questions

01 **What emission standards does this MCP follow?**

The engine uses IPCC-aligned emission factors to ensure calculations meet international reporting standards.

02 **Can I calculate Scope 3 emissions?**

Yes, the MCP includes a specific tool to calculate indirect Scope 3 emissions from your value chain activities.

03 **How does the MCP handle CO2 reinjection?**

You can use the net carbon footprint tool to account for sequestration credits like CO2 reinjection.

04 **What is emission intensity?**

It is a metric that measures carbon emissions relative to your production volume, such as CO2 per barrel.

05 **Which AI clients can use this MCP?**

You can use this MCP with any compatible client including Claude, Cursor, Windsurf, and VS Code.

06 **How are Scope 1 emissions calculated?**

Scope 1 emissions are calculated by summing the emissions from fuel consumption, process venting, and flaring, each multiplied by its specific IPCC-aligned emission factor via the `calculate_scope_1_emissions` tool.

07 **Can I account for CO2 sequestration?**

Yes. You can use `calculate_net_carbon_footprint` and provide the `reinjectionVolume` to subtract sequestered CO2 from your gross emissions.

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 `"co2-emission-tracker": { "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

CO2 Emission Tracker 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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LICENSE & USAGE

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