MCP SERVER | NO CODE | CLOUD HOSTED

Circular Economy Opportunity Identifier MCP

Turn industrial waste streams into measurable resource recovery.

Circular Economy Opportunity Identifier MCP connects your AI agent to specialized frameworks for the oil and gas industry. It helps you track material movements, find ways to reuse waste, and verify that your recovery plans meet US or EU environmental regulations. You can quickly estimate the financial impact of moving from simple disposal to circular resource management.

A+ Quality Score 100/100

circular-economy | waste-management | oil-and-gas | sustainability | resource-recovery

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vinkius.com/en/ai-agent-connect/circular-economy-opportunity-identifier

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.

Circular Economy Opportunity Identifier MCP

4 tools available
Cloud-hosted on Vinkius

You can use this MCP to bridge the gap between raw industrial data and actionable sustainability strategies. Instead of manually tracking every byproduct, your AI client uses analyze_material_flows to map how materials move through your facilities and where waste is actually being generated. Once you identify those points, you can use evaluate_circular_options to rank different recovery methods like recycling or reuse based on their actual viability.

Compliance is a major hurdle in resource recovery, so this MCP includes assess_compliance_risk to check your proposed actions against regional environmental rules in the USA or EU. To make the business case, you can use calculate_economic_impact to see if a circular transition actually makes sense for your bottom line. It turns complex material tracking into a direct way to find value in what used to be considered trash.

Core Capabilities

01 — Material Mapping

Your agent uses this to pinpoint waste generation points within a facility.

02 — Pathway Ranking

Your agent evaluates different reuse and recycling options for specific waste streams.

03 — Regulatory Checking

Your agent verifies that recovery plans meet USA or EU environmental standards.

04 — Financial Modeling

Your agent calculates the economic benefits of switching from disposal to circularity.

One Click on Vinkius — From Prompt to Execution

Available at **vinkius.com/en/ai-agent-connect/circular-economy-opportunity-identifier** — connect your AI agent in three steps.

01 Connect your AI client to the MCP via Vinkius.

02 Provide facility or waste stream data to your agent.

03 The agent uses the tools to map flows and evaluate options.

04 Review the compliance and economic results generated by the agent.

You connect your AI client to the Vinkius hosted MCP to start analyzing industrial data.

Built For

This MCP is built for professionals managing industrial resources and environmental impact in the energy sector.

Sustainability Managers

They hand off waste stream data to the AI to find new recovery pathways.

Operations Engineers

They use the tool to map material flows and identify inefficiencies in a facility.

Compliance Officers

They use the tool to check if new resource recovery plans meet regional laws.

What Changes When You Connect

01 Identifies specific waste points through material flow mapping.

02 Ranks recovery options based on feasibility and value.

03 Validates environmental compliance for USA and EU regions.

04 Provides financial estimates for circularity transitions.

Real-World Applications

Waste Stream Optimization

Identify the most profitable way to handle a specific byproduct in an oil refinery.

Regulatory Pre-check

Verify if a plan to reuse flare gas meets EU environmental standards before implementation.

Facility Auditing

Map material movements to find where a facility is losing value through waste.

Business Case Development

Calculate the expected financial return when moving from waste disposal to material reuse.

Patterns to Avoid

Guessing waste locations

AVOID

You tell your agent that waste is happening in the main processing unit without any actual data. This leads to vague recovery plans that don't solve the real problem.

✓ INSTEAD

Use analyze_material_flows to map exactly where materials move through your facility to find the actual generation points.

Ignoring regional legal constraints

AVOID

You design a recycling plan for a byproduct and assume it's legal everywhere. You might run into major issues with local environmental agencies.

✓ INSTEAD

Run your proposed actions through assess_compliance_risk to ensure they meet specific USA or EU environmental standards.

Focusing only on environmental goals

AVOID

You push for a new reuse process because it's green, but it costs three times more than just paying for disposal. The project gets killed by finance immediately.

✓ INSTEAD

Use calculate_economic_impact to compare the cost of disposal against the actual value of recovery before you pitch the idea.

The Right Fit

Sustainability managers and operations engineers in the energy sector should connect this MCP. It is not for general waste management consultants or small retail businesses. You should use this if you have industrial material flow data and need to turn that data into a validated business case.

Circular Economy Opportunity Identifier Tools

These tools map material movements, evaluate recovery pathways, and validate the financial and regulatory viability of circularity projects.

#	TOOL	DESCRIPTION
01	assess_compliance_risk	This tool checks if your proposed circular economy actions follow regional environmental regulations. It helps you avoid legal issues when planning new recovery processes.
02	calculate_economic_impact	This tool estimates the financial benefits of a specific circularity opportunity. It helps you compare the cost of disposal against the value of recovery.
03	evaluate_circular_options	This tool determines the most viable pathways for a specific waste stream. It helps you decide between reuse, recycling, or other recovery methods.
04	analyze_material_flows	This tool maps how materials move through a facility. It identifies exactly where waste is being generated in your process.

See It in Action

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

U Trace the flow of produced water in facility FAC-99 to find waste points.

The material flow for produced water in FAC-99 shows waste generation at the separation stage and the filtration stage.

U What are the best circular options for waste stream WS-402 if I want to maximize value?

The optimal path for WS-402 is Reuse, which offers the highest feasibility score and estimated value.

U Is reusing flare gas for local power generation compliant with EU regulations?

The proposed action is compliant with EU environmental standards for energy recovery.

Frequently Asked Questions

01 **What industries is this MCP designed for?**

This MCP is specifically designed for the oil and gas industry to manage circular economy transitions.

02 **Can I check compliance for European regulations?**

Yes, the tool includes a function to assess if your proposed actions meet EU environmental regulations.

03 **How does the MCP help with waste management?**

It maps material flows to find waste points and then evaluates the best ways to reuse or recycle those materials.

04 **Does this MCP help with the financial side of sustainability?**

Yes, you can use the economic impact tool to estimate the financial benefits of circularity compared to traditional disposal.

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

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

06 **How can I find where waste is being generated in my facility?**

You can use the `analyze_material_flows` tool to trace a specific substance through its entire lifecycle within a facility to identify exact waste points.

07 **Does this tool support regulatory checks for the European Union?**

Yes, the `assess_compliance_risk` tool supports regulatory validation for both the USA and the EU.

08 **Can I estimate the savings from a recycling project?**

Yes, by using `calculate_economic_impact`, you can determine net value creation and cost savings compared to current disposal methods.

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 `"circular-economy-opportunity-identifier": { "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

Circular Economy Opportunity Identifier 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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DOCUMENT INFORMATION

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Platform	Vinkius Cloud for AI Agents
Endpoint	`https://edge.vinkius.com/{token}/mcp`

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