

AI IN LCA: INNOVATIONS, APPLICATIONS, AND CHALLENGES

The First AI-Native Platform for Sustainability Analysis



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Carlos Gaete-Morales, PhD

Founder & CTO

ecosemantic.com

Live Demo: AI Data Center LCA

Real queries against ecoinvent 3.12 via Model Context Protocol — watch on your device

Q1

"I am searching for AI data center datasets using the latest ecoinvent version"

~1:30 Semantic search across 26,533 activities — identifying gaps in existing databases

Q2

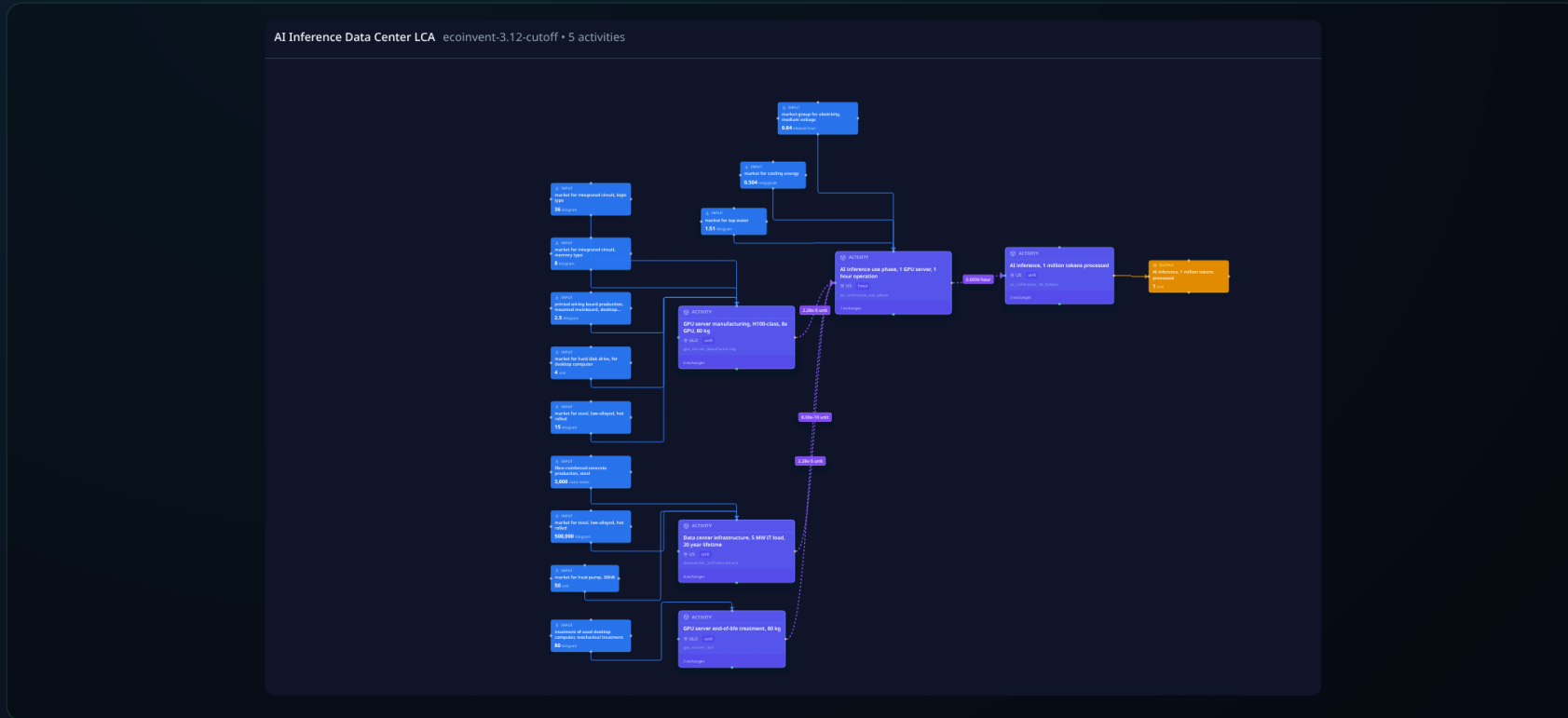
"Create a detailed custom LCA project for AI inference using data centers. Functional unit: processing 1 million tokens"

~4:00 Define functional unit → Create foreground activity → Link technosphere exchanges to ecoinvent → Calculate with IPCC 2021 GWP100

On your device: Real-time activity feed with tool calls, project graph building live with animated nodes, and full audit trail.

Demo Result: AI Inference Data Center LCA

Custom project graph built from two natural-language queries — full chat transcript: claude.ai/share/2b19827d-59ff-4630-a538-98188cbe08a9



Note: This demo shows a minimal case — two questions, one session. A professional LCA workflow would involve the expert creating a plan with the AI agent, attaching tools for internet research, reading PDF papers and technical documentation, connecting to ERP/SAP systems for Bill of Materials, constructing a proper inventory, and several iterative correction messages between the expert and the agent.

What You Just Saw



Graph-Based Semantic Search

Natural language queries against 7 Neo4j databases — ecoinvent 3.6 to 3.12, 26,533 activities, 9,850 biosphere flows



Custom Project Modeling

Create activities and link to ecoinvent background data — model products that don't exist in standard databases



Real-Time LCA Calculation

Brightway2 engine with full provenance — database version, activity UUID, impact method, all traceable and auditable



Live Spectator Workspace

You watched it build in real-time on your device — every tool call, every graph node, complete transparency

31

MCP Tools

85%

Context Reduction

80+

Users · 15 Countries

Open

MCP Protocol

Thank You

Let's build the future of AI-powered LCA together

► Research & Postgraduate Thesis

Validation methodologies, multi-agent LCA, graph query optimization, AI-LCA integration patterns.

Free Professional access for academic research.

► Hands-On Workshop

Configure EcoSemantic with Claude, ChatGPT, Cursor, VS Code, GitHub Copilot.

Register on Eventbrite

eventbrite.com – search "EcoSemantic"

Coming soon: Specialized AI Agents for enterprise LCA workflows — automated search, modeling, and reporting



Join our Discord community: discord.gg/jBH3nkfH6E

Platform: ecosemantic.com

Docs: docs.ecosemantic.com

Email: carlos.gaete@ecosemantic.com

ETHZ2026-500 — 500 bonus tool calls + 14-day Professional access

Carlos Gaete-Morales, PhD · Founder & CTO, EcoSemantic · Kimel Tech SpA