

Gurobi & OET Welcome Keynote



Dr. Oliver Bastert
Gurobi Optimization



Dr. Martha Fryszacki
Open Energy Transition

Open by Design: Scaling Innovation for the Energy Transition

Our mission for innovation, flagship projects, and vision for an open, impactful energy future.

Dr. Martha Frysztacki

Energy Innovation Summit 2025

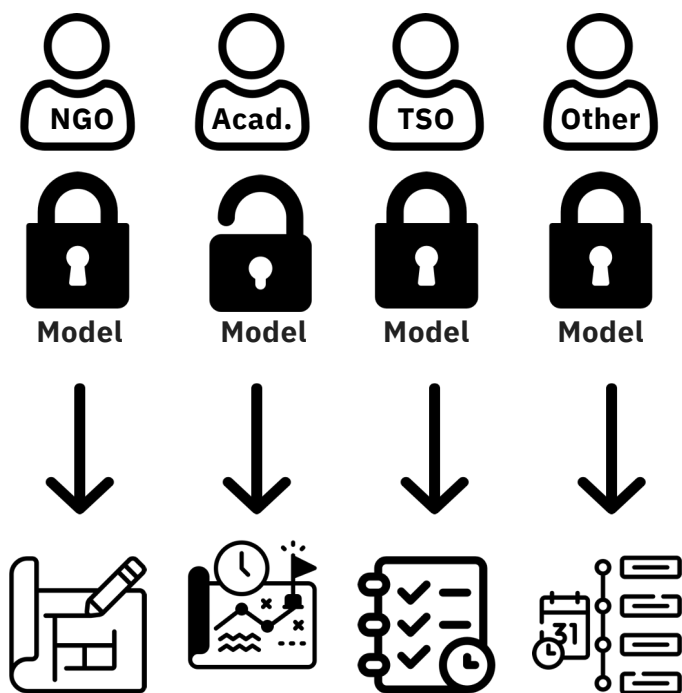
24.06.2025



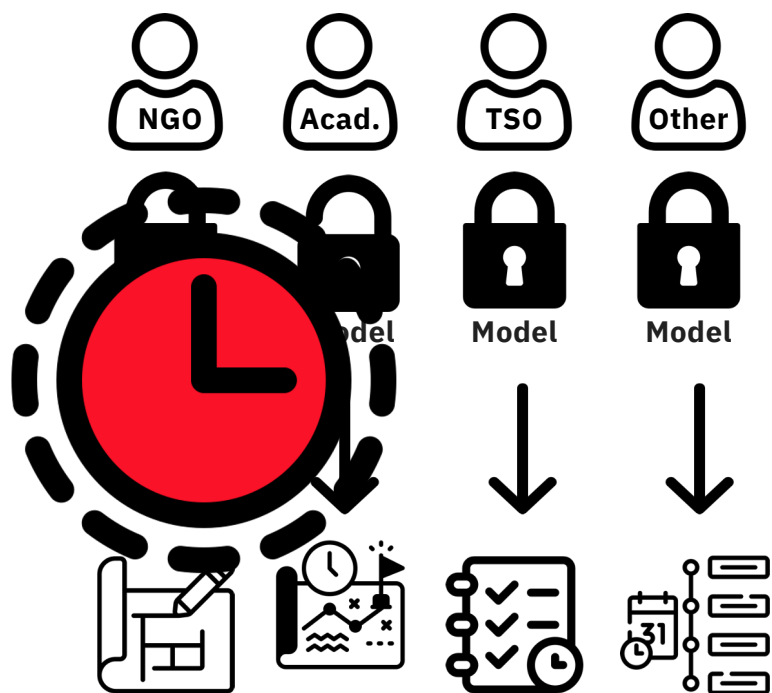
**Big investments only pay off
when the plan is trusted by
everyone it touches**

- Why Open Energy Planning, Why Now? -

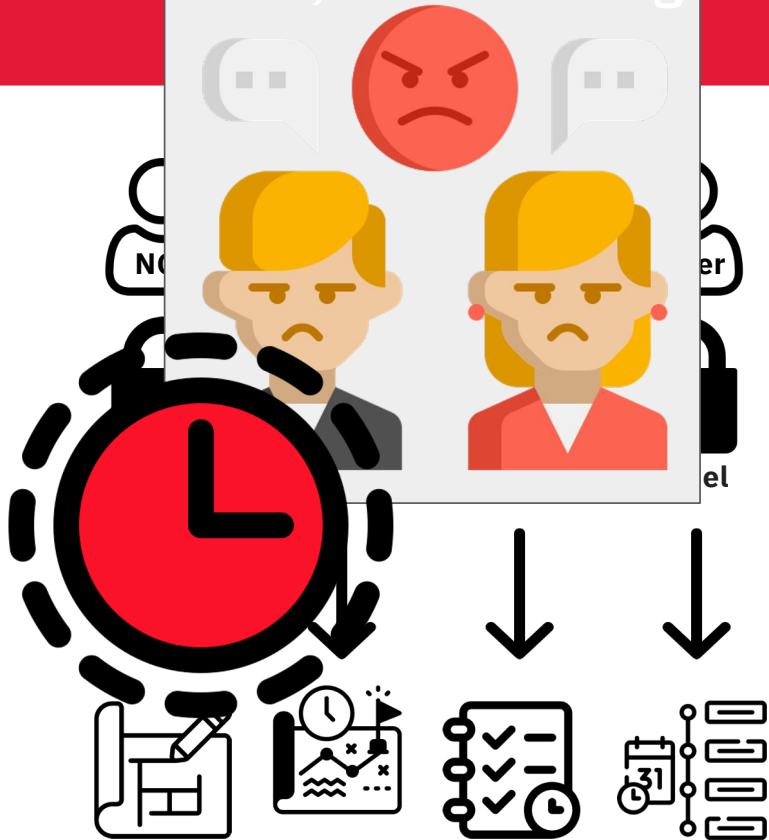
Energy planning sits at the heart of the energy transition, but: Planning landscape is fragmented



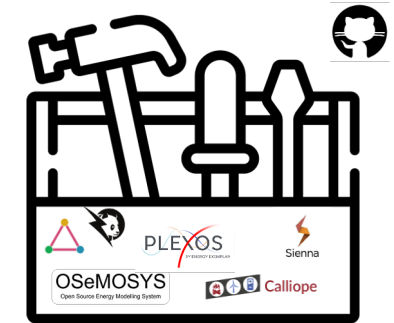
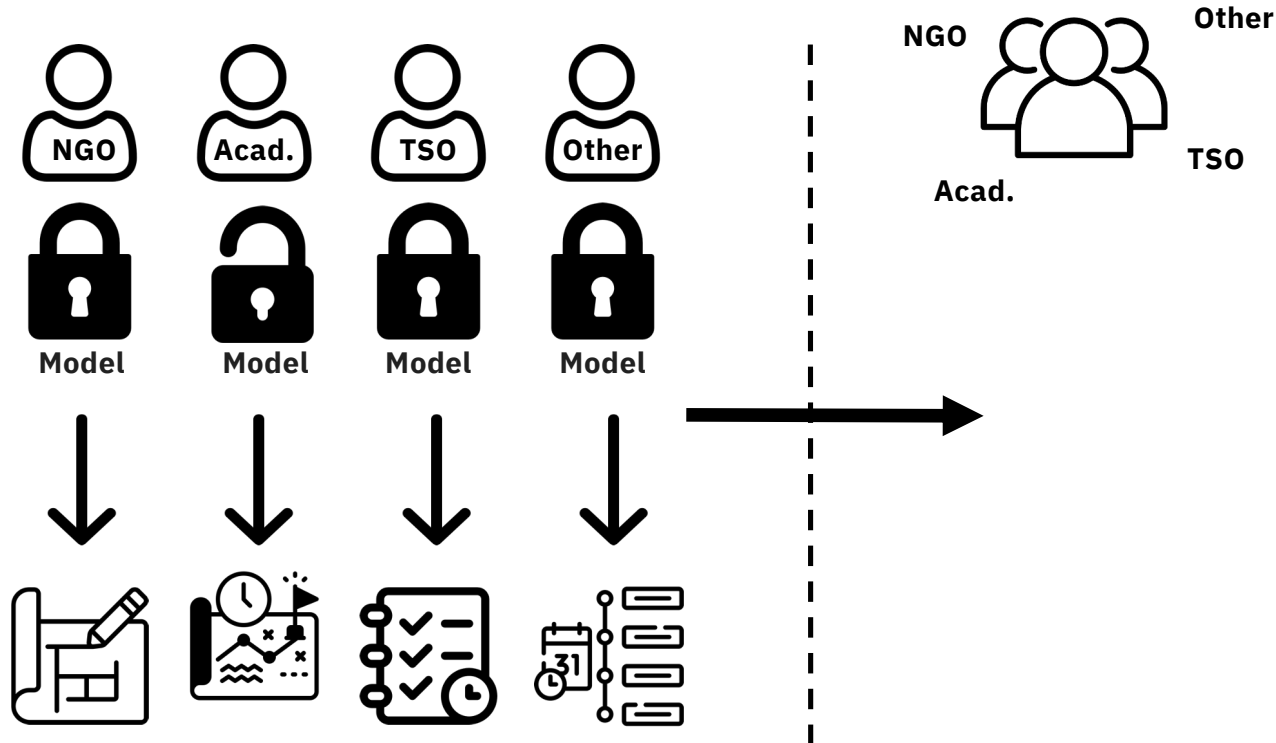
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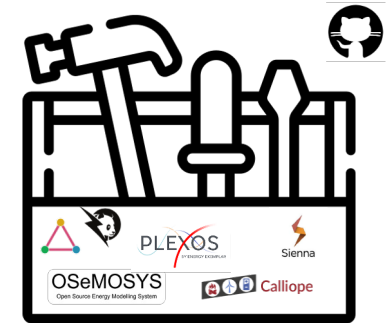
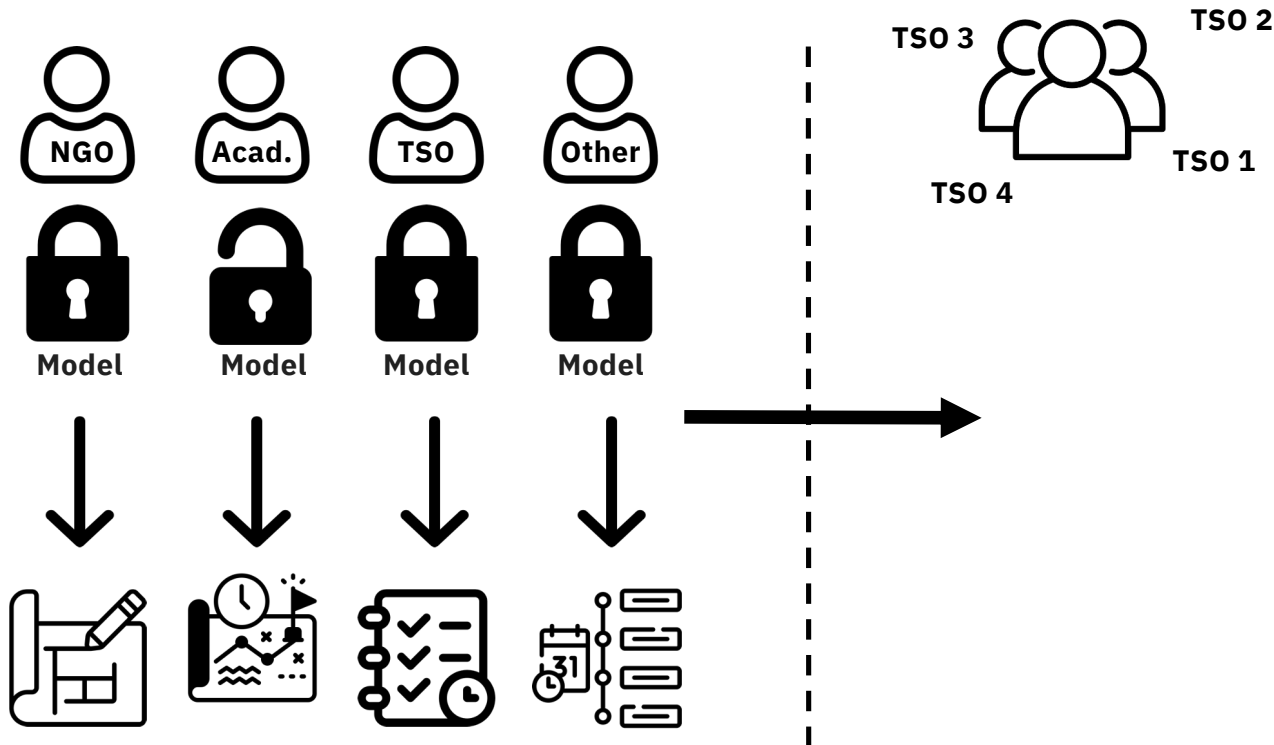
Our vision for Energy Planning: Connected, Innovative and Transparent



Set of interoperable open-source & conventional tools



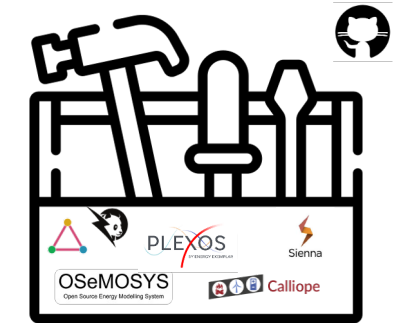
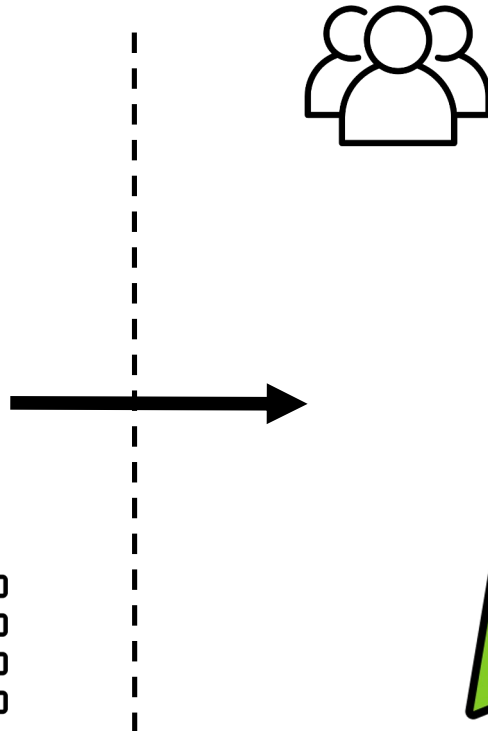
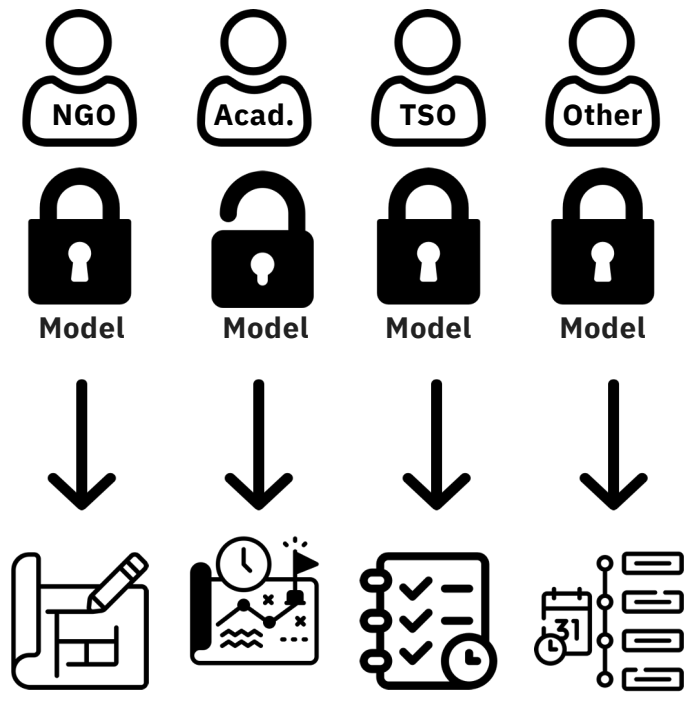
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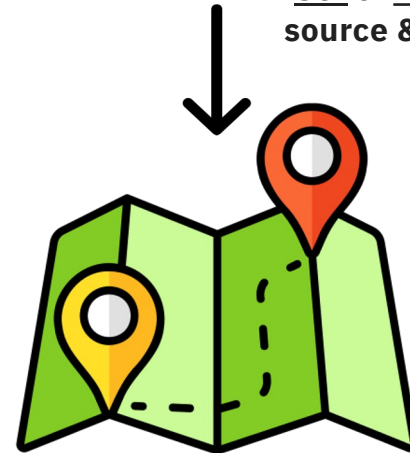
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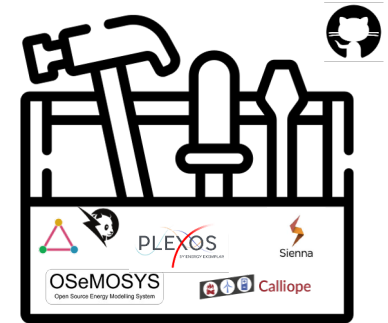
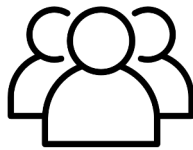
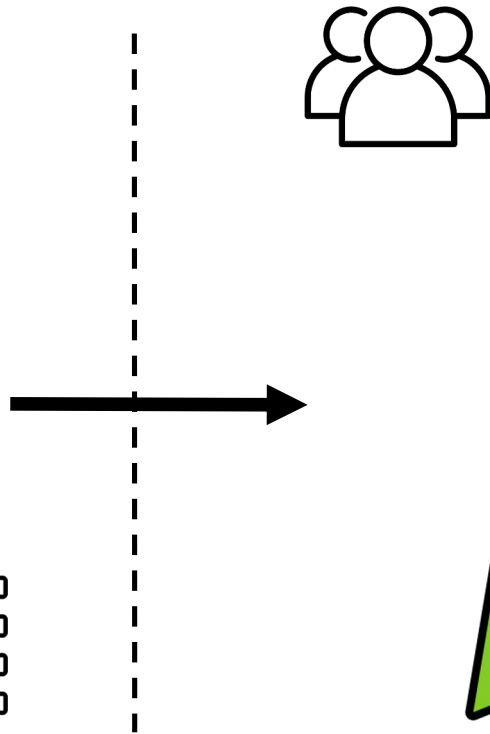
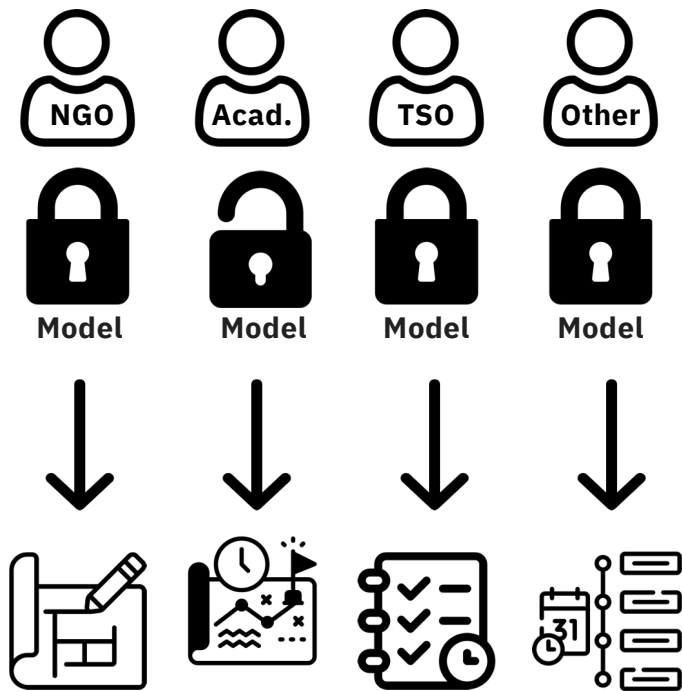
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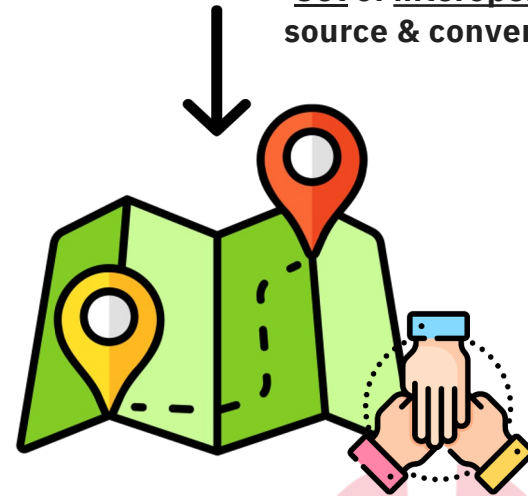
Set of interoperable open-source & conventional tools



Our vision for Energy Planning: Connected, Innovative and Transparent



Set of interoperable open-source & conventional tools



Our vision for Energy Planning: Connected, Innovative and Transparent

- **Modern planning tools are becoming more accessible, transparent, and easy to scale – connecting stakeholders across sectors. The status quo can't deliver net zero at speed or scale needed**
- **Open planning unlocks faster innovation and delivery, making net-zero goals more attainable**
- **Today's open tools already match or exceed traditional alternatives, and ongoing work will close the remaining gaps**

- Making it real -

Barriers to overcome (for open-source tools)

- **Lack of trust** in open-source tools for high-stakes decision-making
- **Lack of knowledge** that open-source alternatives are available
- **Gaps in usability, support, and security**
- **Lack of interoperability** that enable easy tooling switches
- **Poor quality of data** in some regions
- **Limited institutional capacity** to adopt solutions without support

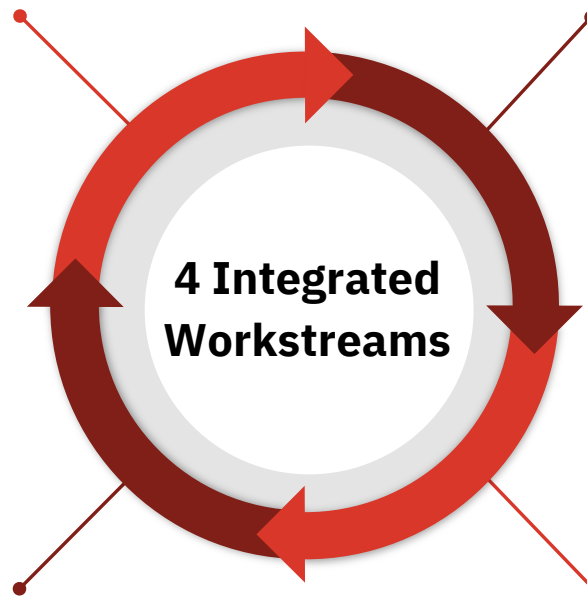
Systemic Change through data, tools, credibility, and collaboration

Reliable Open Data

Creating trusted global data resources that everyone can use.

Adoption & Capacity Building

Growing a global community of planners, advocates, and trainers to make open planning the new standard.



Institutional Pilots & Credibility

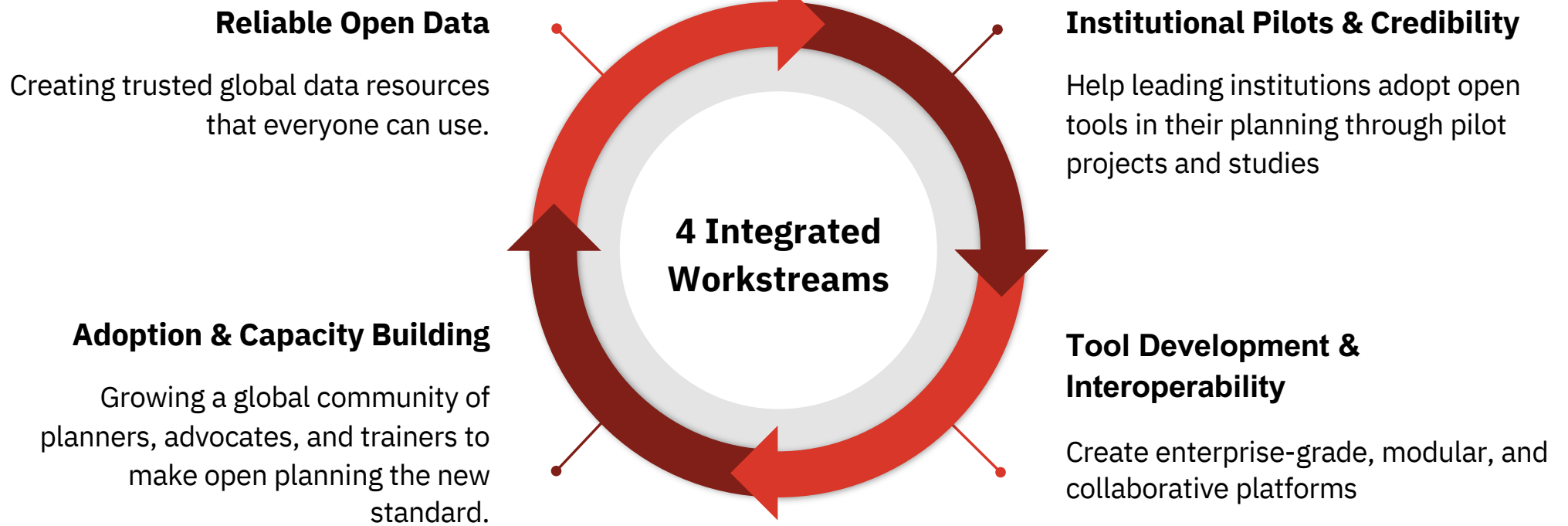
Help leading institutions adopt open tools in their planning through pilot projects and studies

Tool Development & Interoperability

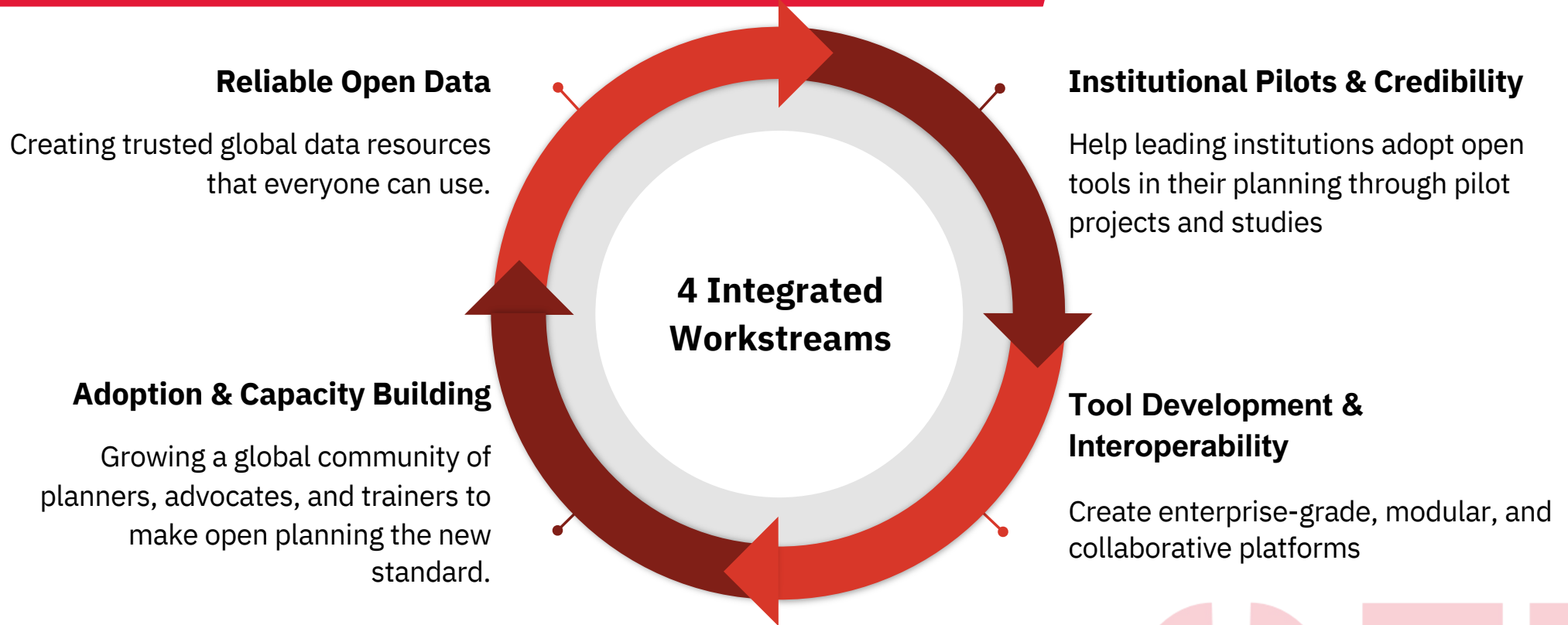
Create enterprise-grade, modular, and collaborative platforms



Systemic Change through data, tools, credibility, and collaboration

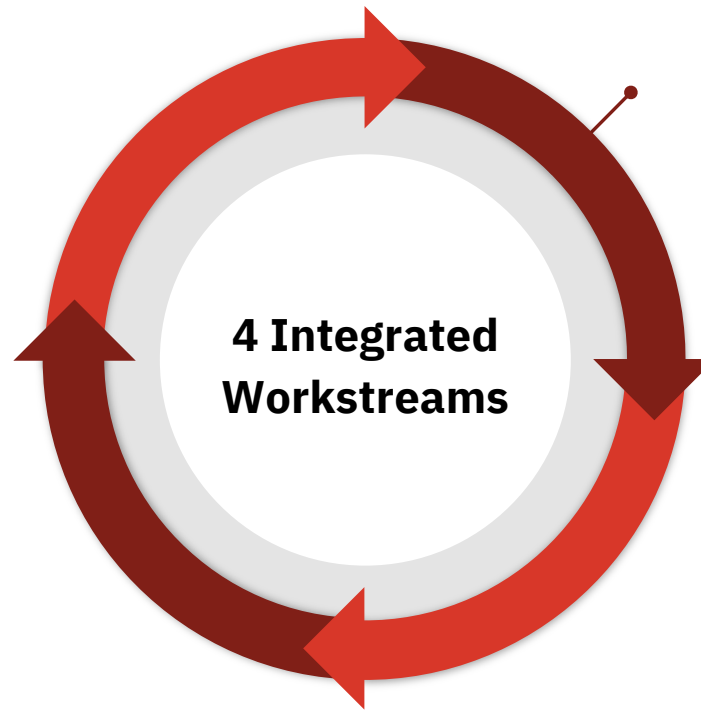


Systemic Change through data, tools, credibility, and collaboration



Credibility First: Institutional Pilots

Building Trust Through Real-World Pilots



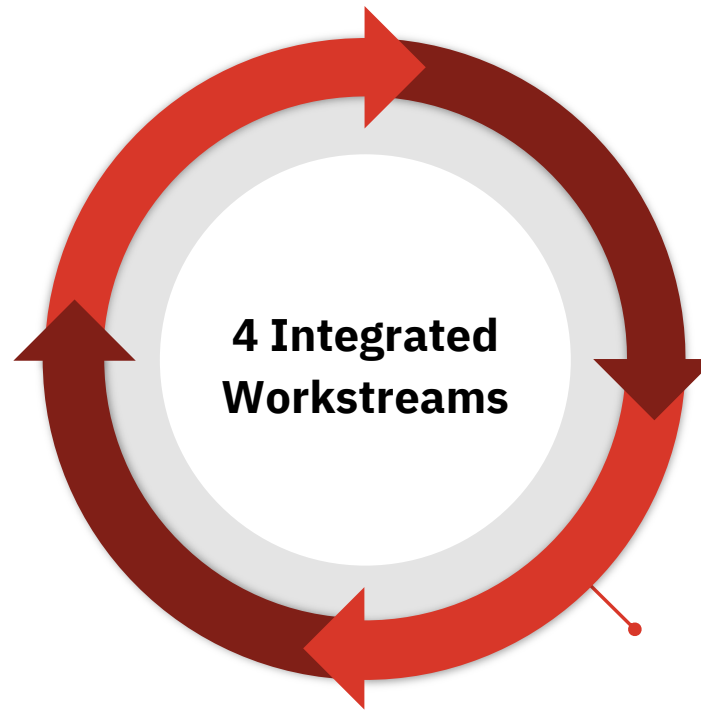
Institutional Pilots & Credibility

Embed open tools in high-trust, high-impact planning processes: ENTSO-E, ACER, individual TSOs, NEPAD, ...



Tooling That's Built to Scale

Enterprise-grade, open platforms built for collaboration, interoperability, and global adoption.



Tool Development & Interoperability

Proprietary and OS tools (PyPSA, PLEXOS, pandapower, etc.) that are in use need to become interoperable

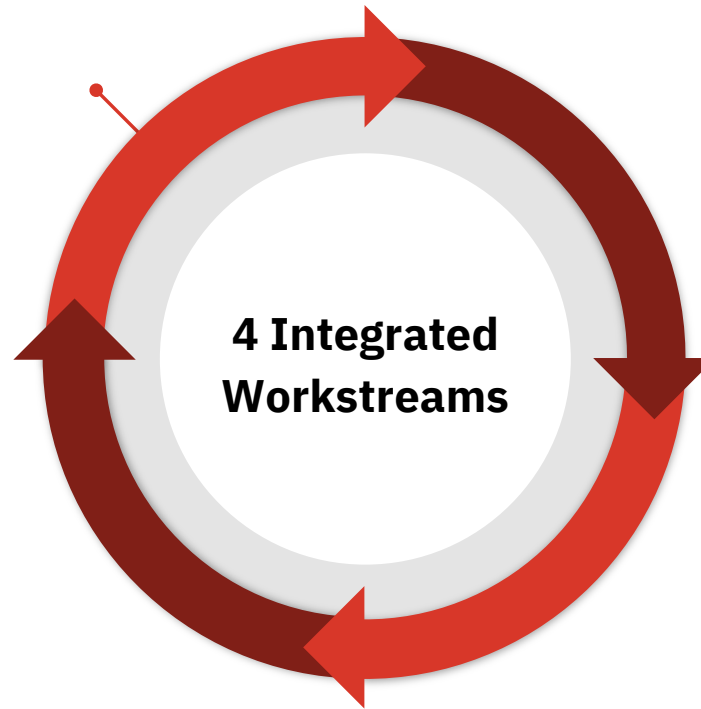


Open Data to Match Open Tools

Models are only as good as the data they use.

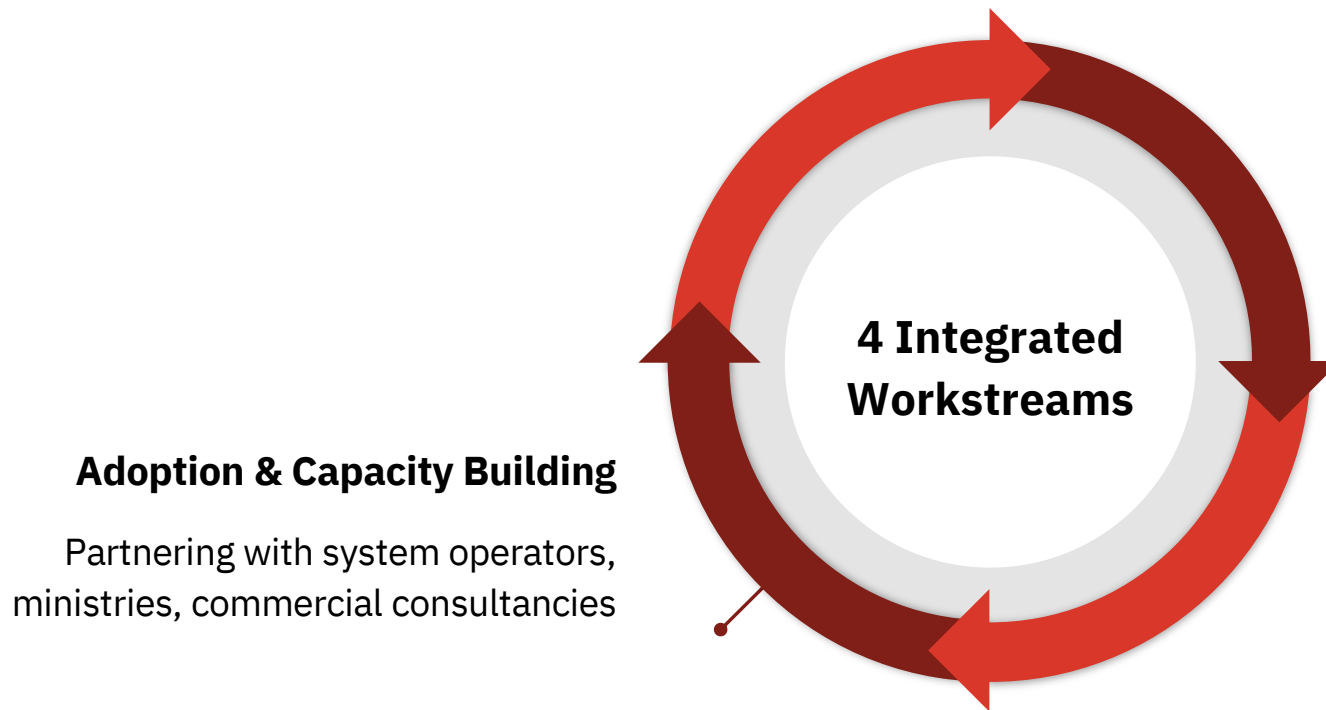
Reliable Open Data
Grid mapping (OSM, goal: 98% global MV/HV grid mapped), demand data & global validation pipelines

Building global validation pipelines, FAIR-compliant standards.



Driving Global Adoption

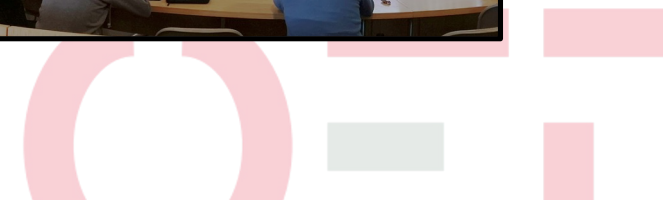
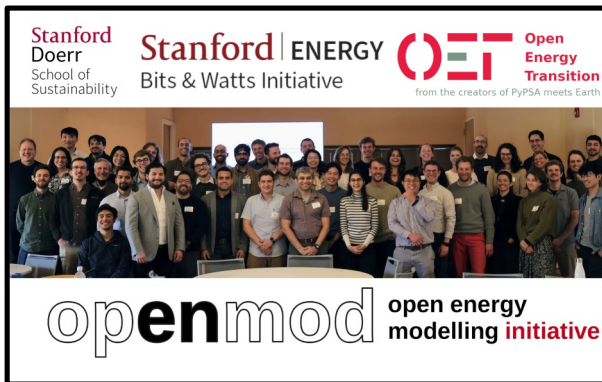
Building a skilled, connected, and active open planning community



**- Let's Build the Future
Together: Better & Faster -**

From Talk to Action. Together.

You're not betting on an idea.
You're joining a movement that's already working.



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You're not betting on an idea.

You're joining a movement that's already working.



Meet us at the Summit



Dr. Maximilian Parzen
CEO & co-founder



Keynote Speaker

Dr. Martha Maria Fryszacki
Head of Energy System Modeling & co-founder



Hazem Abdel-Khalek
Head of Modeling Tools and Data & co-founder



Workshop Host

Dr. Harry van der Weijde
Head of Research and Market Development



Trainer, PyPSA modelling track

Dr. Ekaterina Fedotova
Project Manager: Climate & Energy Modeling



Trainer, PyPSA modelling track

Priyesh Gosai
Energy System Modeler and Training Coordinator



Trainer, PyPSA modelling track

Dr. Daniele Lerede
Energy System Modeler



Andreas Hernandez Denyer
Junior Data & Energy System Modeler



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- **Annex** -

Our Tools & Models

We are a worldwide non-profit which accelerates the energy transition by empowering energy planners through open-source software and open data solutions.

Our services:

- **Transparent and reproducible** energy planning **studies** that come with all models and data.
- Development and maintenance of **open-source software** and **open datasets** for energy planning, including integration into existing workflows, setting up data pipelines, and improving interoperability
- **Training and support** for open energy modeling solutions

Our clients and partners:

- Transmission System Operators (e.g. ENTSO-E)
- Regulators (e.g. ACER)
- Non Governmental Organizations (e.g. Project Innerspace, EDF)
- Universities (e.g. Stanford University)
- Investors (e.g. Form Energy)
- Philanthropies (e.g. Breakthrough Energy, Google.org)



PyPSA/atlite



GenX.jl



OSeMOSYS
Open Source Energy Modelling System



OpenStreetMap



Open Energy Transition

Transforming Energy Planning with Open Source and Open Data

Founded by developers of open-source energy models, including the widely used Python for Power System Analysis (PyPSA) framework, OET specializes in adapting tools for practical energy planning.

Since its establishment in early 2023, OET and its 50 team members have delivered customized open-source and open data solutions to address specific needs of transmission system operators, foundations, and NGOs.

Through open models and open data, OET aims to transform energy planning, enabling stakeholders to collaborate effectively and contribute to a sustainable, transparent and inclusive energy future.





Energy Innovation Summit
Modeling Meets Optimization

Welcome

Dr. Oliver Bastert
CTO, Gurobi Optimization



Coming in, what is great about Gurobi?

Talent

Culture

Focus

Algorithms

Infrastructure

Expertise



We all love maths but what matters is ...

Fall in love with the problem,
not the solution.

```
84 function __generator(thisArg, body) {
85   var _ = { label: 0, sent: function() { ... }, ... };
86   return g = { next: verb(), "throw": verb(), "return": verb() };
87   function verb(n) { return function() { ... }; }
88   function step(op) {
89     if (f) throw new TypeError("generator is already running...");
90     while (1) try {
91       if (y = op, t) op = (op[0] & 1, t);
92       switch (op[0]) {
93         case 0: case 1: t = op; break;
94         case 4: _.label++; return { value: op[1], done: false };
95         case 5: _.label++; y = op[1]; op = op[2]; continue;
96         case 7: op = _.ops.pop(); _.trys.pop(); continue;
97         default:
98           if (!(t = _.trys, t = t.length - 1) && t.length > 0)
99             if (op[0] === 3 && (t || (op[0] = 4, op[1] = op[2], op[2] = [])))
100               if (op[0] === 6 && _.label < t[1])
101                 if (t && _.label < t[2]) { ... }

```



Disclaimer

This presentation includes forward-looking statements, including, but not limited to, product roadmaps, features under consideration, and anticipated timelines. These statements are for informational purposes only and do not represent a commitment, promise, or legal obligation for Gurobi Optimization, LLC (“Gurobi”) to deliver any product, feature, or functionality to a customer or prospective customer (“Customer”). The development, release, and timing of any feature or functionality described remain at Gurobi’s sole discretion and may be changed without notice.

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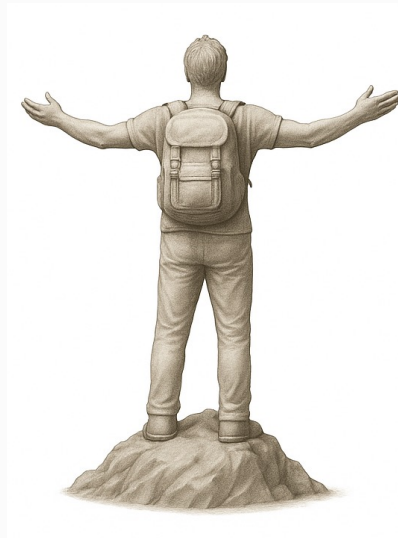


Optimizer Priorities



Performance

Out-of-the-box,
numerically stable and
scalable



Breadth

Mixed-Integer and
Nonlinear and Global
Optimization



Depth

Specific modeling
elements and heuristics



Gas Networks

- OGE wants repurpose gas pipelines for hydrogen
- Doing The Math developed a capacity planning model which ensures
- Minimal flow curtailments
- Limited pressure load cycles
- Sparse, stable control actions



- Hybrid MINLP Formulation
Nonlinear for pipe flow physics
- Sequential Solve Strategy
MIP -> NL

- Significant enhancements in continuous and mixed-integer nonlinear performance
- Added signpower() function

Gurobi & GPU

Research

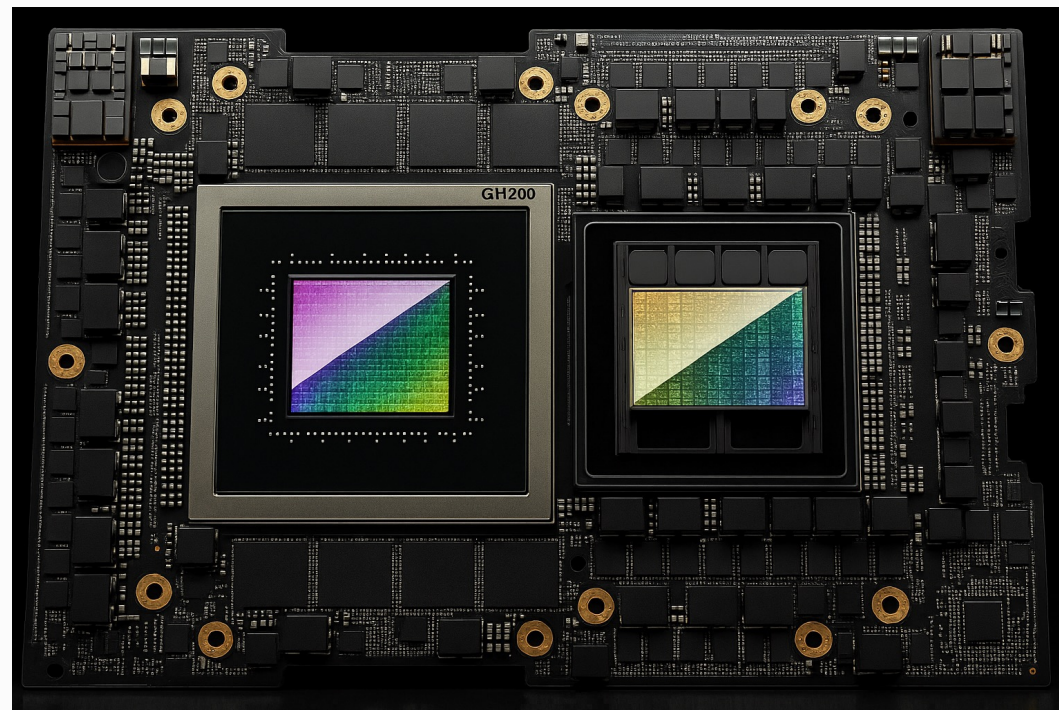
- Algorithms?
- Hardware?

Innovate

- Add missing links
- Measure benefit

Productize

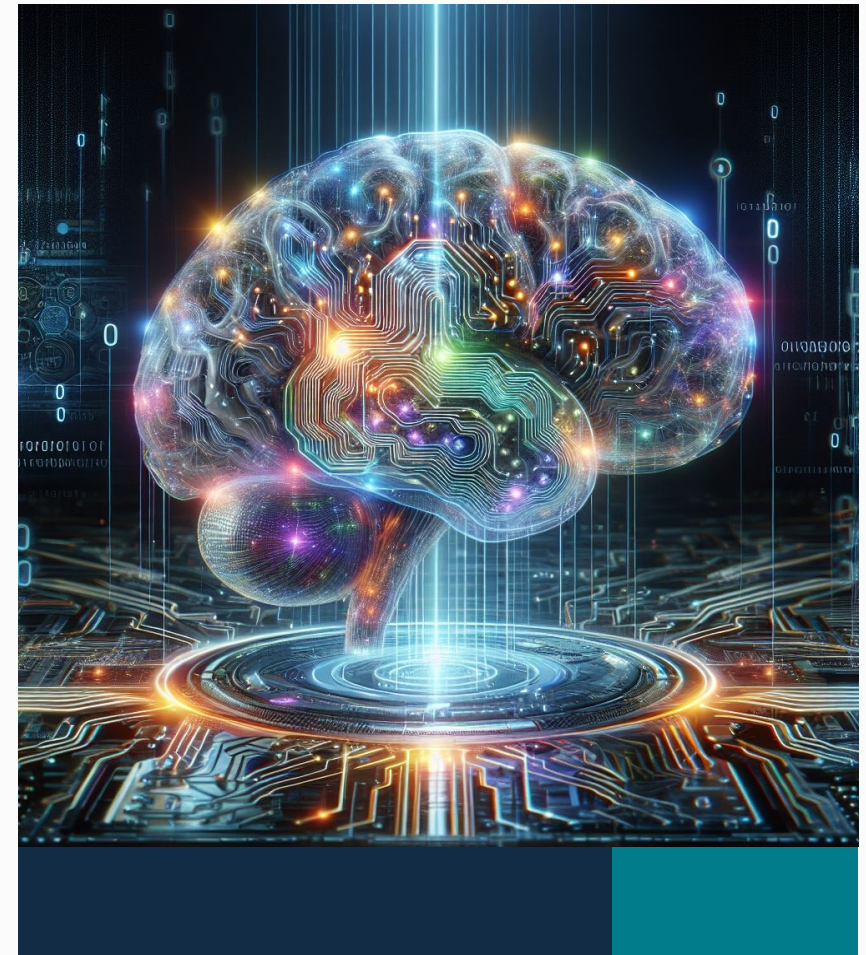
- Integrate with product
- Explain and document





Gurobot

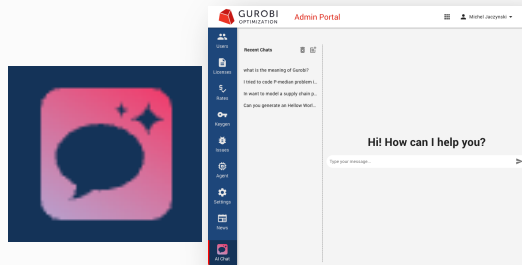
Delivers instant, expert-level assistance for its users and marks our first step in making optimization more accessible, interactive, and intelligent through Generative AI.



Key Features

- **Instant Issue Resolution:**
 - Troubleshoot problems as soon as they arise—no need to wait in line.
- **Smart Resource Links:**
 - Get direct links to the most relevant documentation based on your conversation—no digging required.
- **Contextualized Responses:**
 - Receive personalized answers that take your specific licensing information into account.
- **Built-in Best Practices:**
 - Receive guidance grounded in content backed by Gurobi experts.
- **Code Snippets on Demand:**
 - Need an example? Get ready-to-run snippets tailored to your situation. Run gurobipy code snippets to validate syntax.
- **Easy Escalation:**
 - Turn any chat into a formal support request when human assistance is needed.
- **Streamlined Feedback:**
 - Provide Gurobot with immediate feedback using simple thumbs-up and thumbs-down buttons.

Architecture Overview



- Gurobi Portal:
- Chats
 - Chat history



API and
Orchestration



AWS Bedrock

RAG

Knowledge Base



Claude Sonnet 4



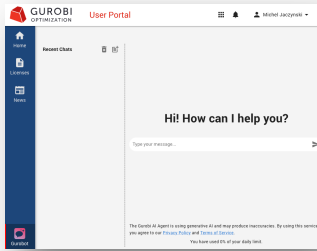
Action Group

- Code Interpreter (gurobipy)
- Websearch
- Portal API

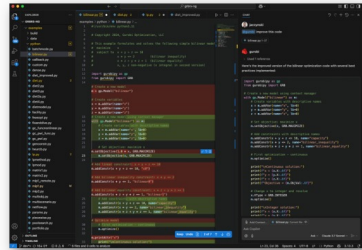
Gurobi Intelligence Vision



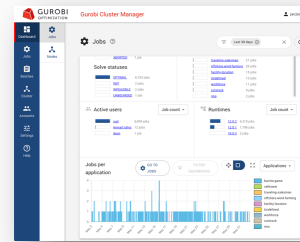
Interfaces and Integration



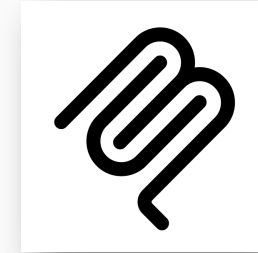
Chatbot



IDE: VSCode, Jetbrain...

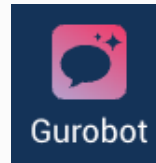


Assistants in context:
Cluster Manager, CLI



Interoperability:
MCP, A2A

Orchestration and APIs



Agents for Gurobi related tasks:
Support, Tuning, Insight, Modeling, Solving...

Components



Knowledge Base to capture
Gurobi best practices



Gurobi Tools:
Optimizer, Tuner, Explainer
Instant Cloud, Compute Server



LLMs:
Claude, Cohere...



Energy Innovation Summit
Modeling Meets Optimization

Thank you!

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