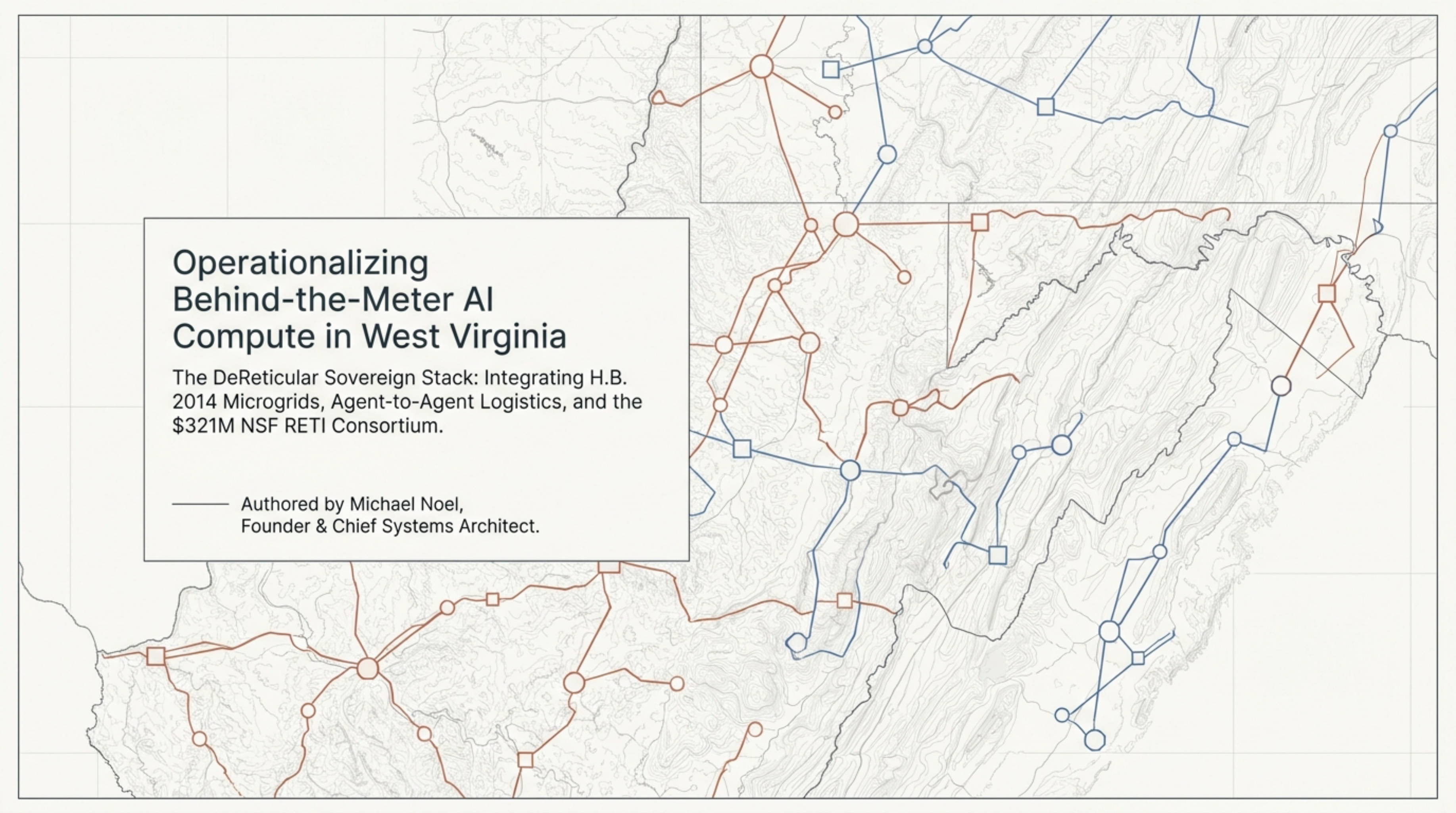


A topographic map of West Virginia is shown in the background. Overlaid on the map is a network of lines and nodes. Red lines and nodes form a dense network in the western and central parts of the state, while blue lines and nodes are more prominent in the eastern part. The nodes are represented by circles and squares, some filled and some hollow. The lines connect these nodes, creating a web-like structure across the state's terrain.

Operationalizing Behind-the-Meter AI Compute in West Virginia

The DeReticular Sovereign Stack: Integrating H.B.
2014 Microgrids, Agent-to-Agent Logistics, and the
\$321M NSF RETI Consortium.

— Authored by Michael Noel,
Founder & Chief Systems Architect.

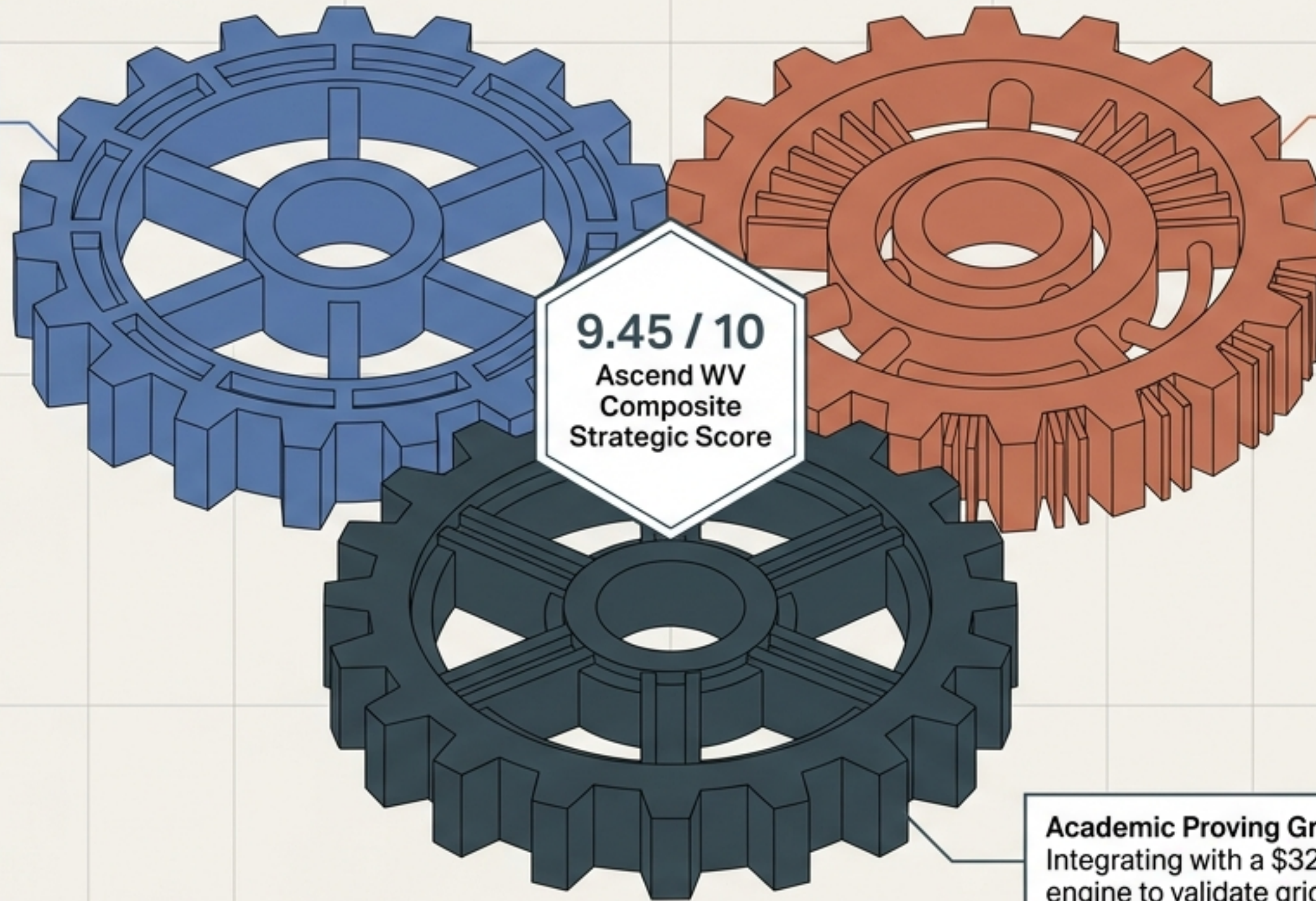
Aligning regulatory law, thermodynamic economics, and academic research

Regulatory Catalyst (H.B. 2014):
Statutory exemptions allowing rapid, off-grid microgrid deployment.

Economic Engine (6 Profit Centers):
AI-native infrastructure monetizing energy-to-compute arbitrage.

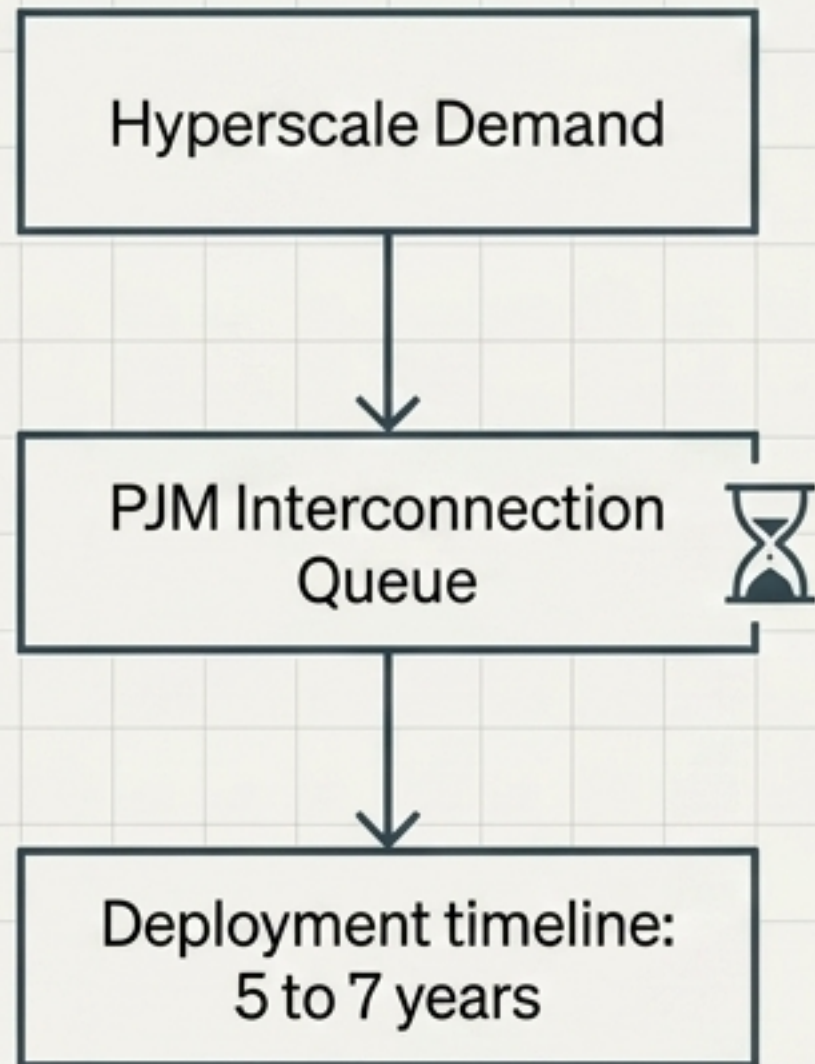
9.45 / 10
Ascend WV
Composite
Strategic Score

Academic Proving Ground (WVU/RETI):
Integrating with a \$321M federal R&D engine to validate grid-edge resilience.



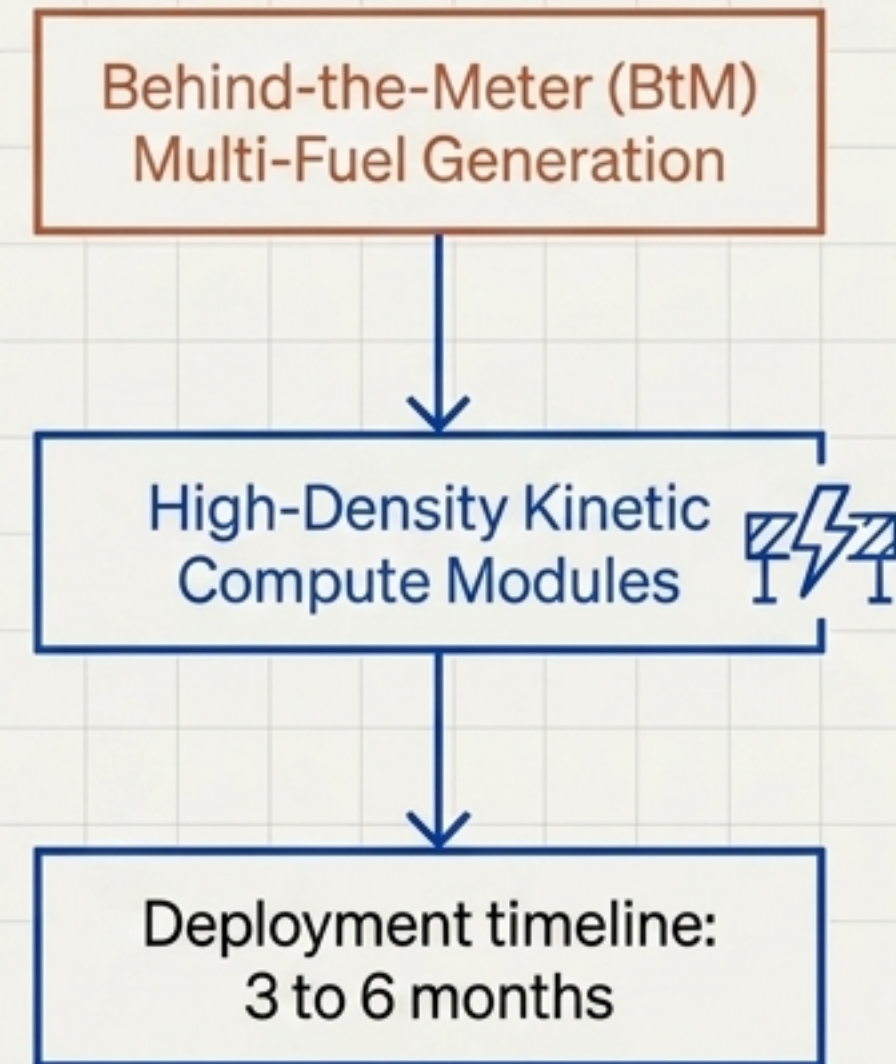
Bypassing the multi-year utility transmission queue to deploy AI infrastructure rapidly.

The Line (Legacy Approach)



Hyperscale demands trigger multi-year interconnection studies and capacity shortfalls.

Spherical Resilience (DeReticular)



Deployed directly on-site, totally bypassing regional transmission grid queues.

A purpose-built legal framework for independent edge compute.



PSC Exemption (§24-2-21 a)

Total exemption from Public Service Commission rate regulation and “duty to serve” mandates.



Queue Bypass (§24-2F-8)

Exemption from net-metering standards, allowing the microgrid to bypass PJM transmission delays.



Statutory Preemption

Microgrid certification consolidates authority at the state level, overriding restrictive municipal or county zoning bans.

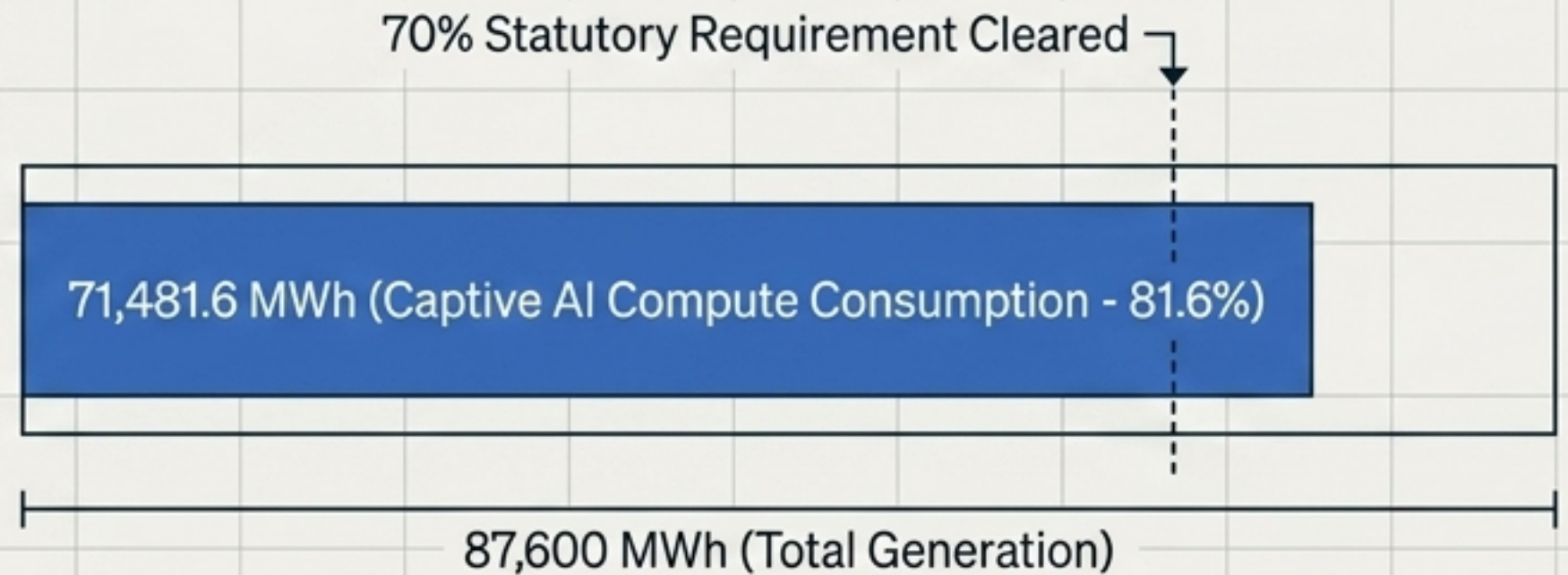


Captive Power Mandate

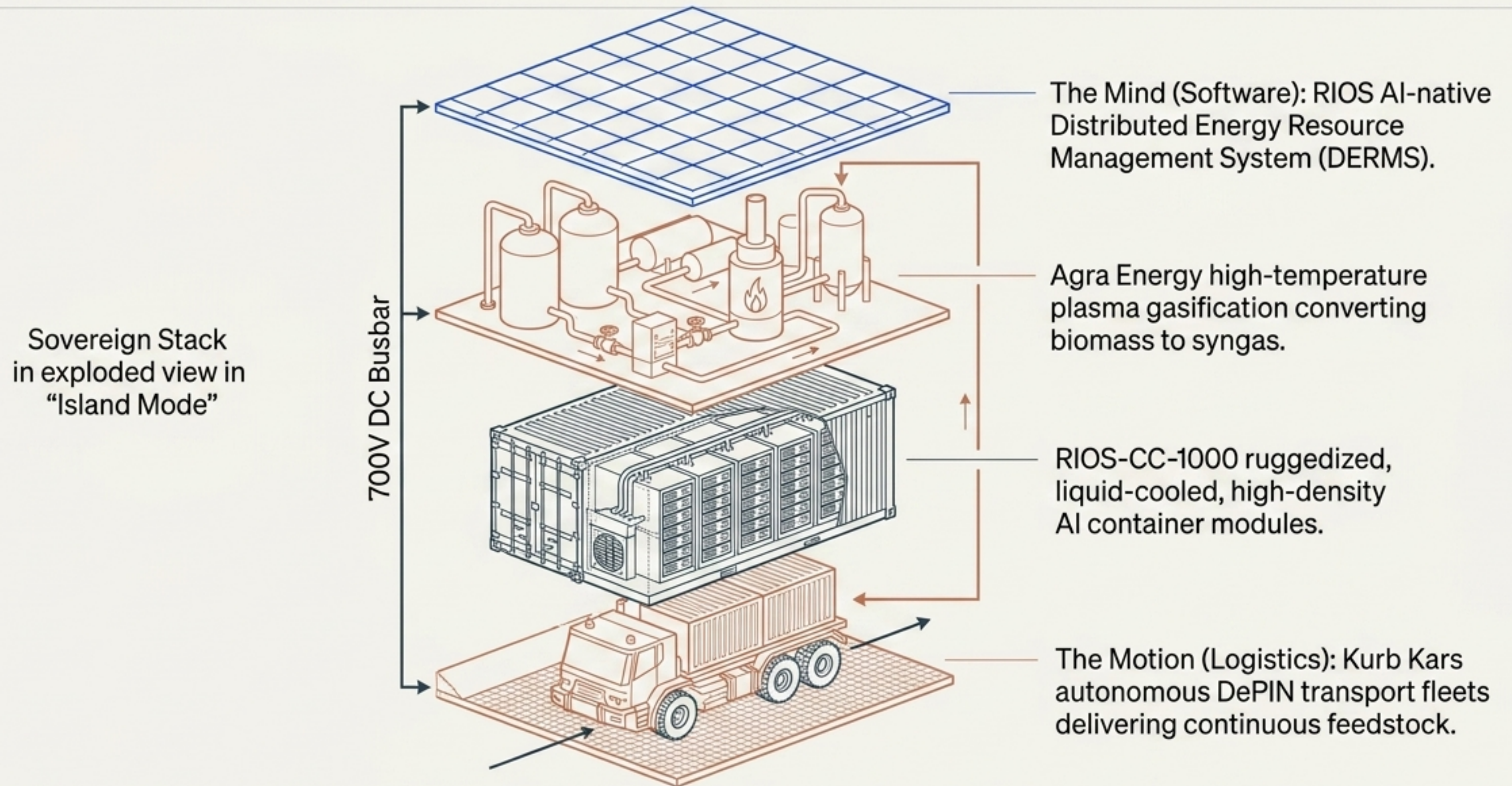
Statutory requirement that $\geq 70\%$ of energy generated within the district is consumed locally by on-site operations.

High-density AI workloads naturally satisfy state microgrid consumption mandates.

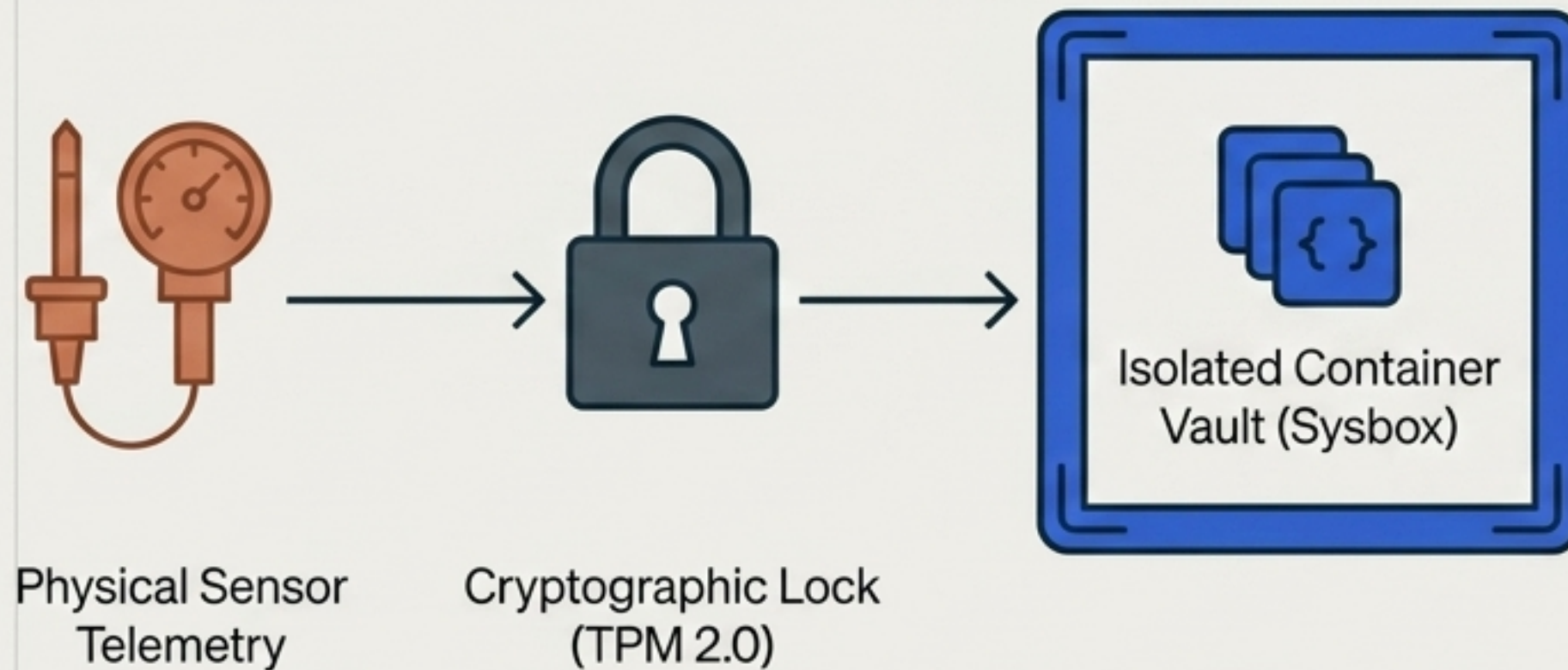
- Traditional manufacturing loads fluctuate, risking non-compliance with H.B. 2014's 70% captive consumption rule.
- Large Language Model (LLM) inference provides a near-constant, flat load profile (95% capacity factor).
- The Proof: A 10 MW Agra Energy prime power system generates 87,600 MWh/year. A RIOS-CC-1000 module draws a continuous 8.5 MW (71,481.6 MWh/year).
- **Result:** An 81.6% captive power ratio, mathematically securing Certified Microgrid status.



Four integrated layers decouple AI clusters from central grids.



Hardware-verified oracles isolate critical microgrid controls from AI workloads



TPM 2.0 Silicon Root-of-Trust

Every telemetric packet (current, thermal, gas) is cryptographically signed at the silicon level, eliminating "Oracle Attacks" and spoofing.

Sysbox Isolated Runtimes

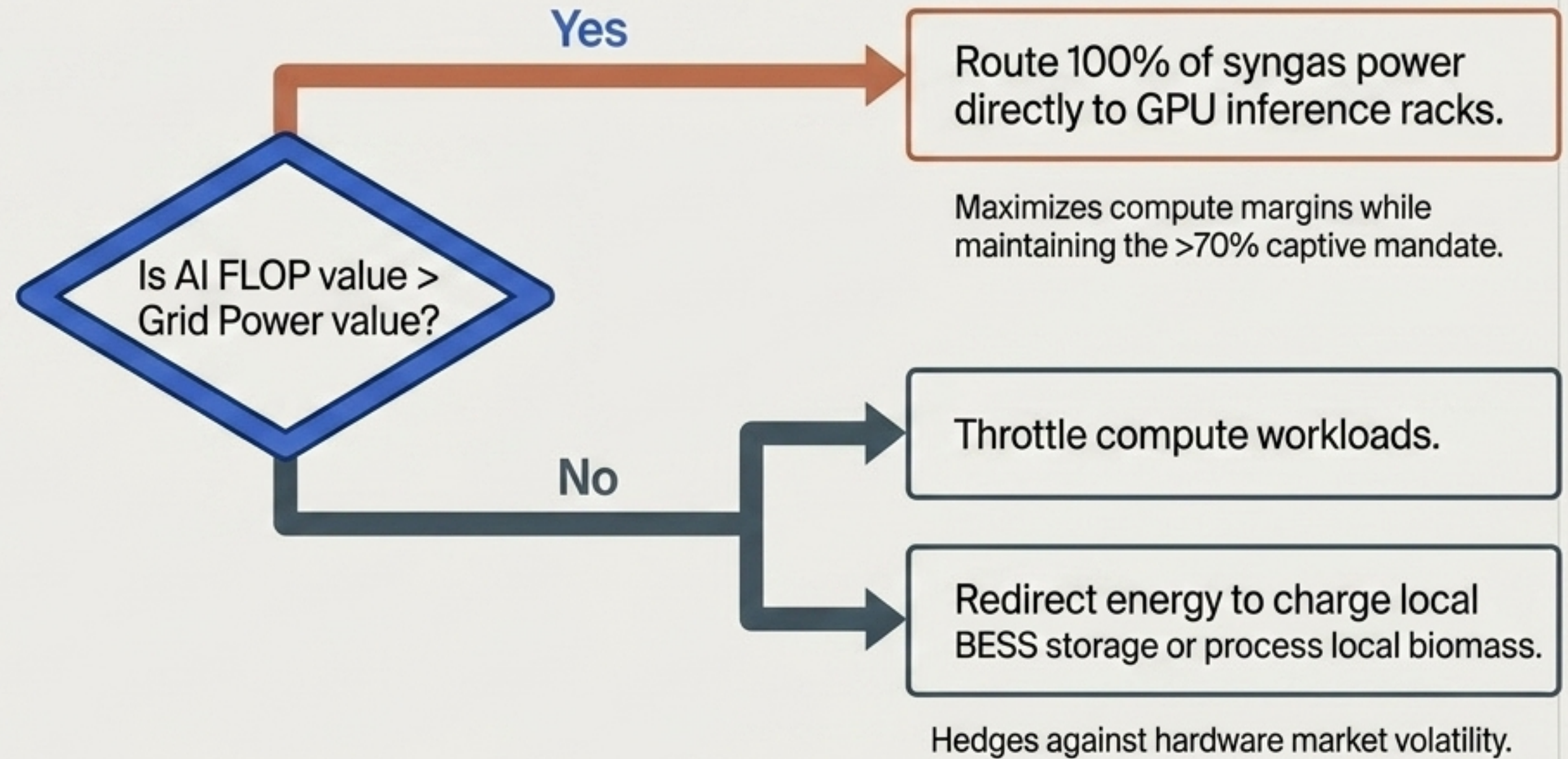
Specialized rootless microVMs isolate GPU workflows, preventing compromised AI models from escaping into the physical microgrid control loops.

Mesh Redundancy

Hyphernet peer-to-peer protocols ensure local control loops remain operational even during total satellite or cellular blackouts.

RLOS algorithmically routes power to maximize immediate economic yield.

The “Spark Spread” engine continuously evaluates the real-time monetary value of executing FLOPs versus the cost of power.



A multi-revenue design decouples the infrastructure from single-market volatility.



1. AI Compute

GPU CaaS contracts

65% – 82% margin



2. Agra Energy

Captive power & Biochar

50% – 70% margin



3. RIOS Software

SaaS & Arbitrage cuts

85% – 92% margin



4. Kurb Kars

Freight & MaaS logistics

40% – 55% margin



5. DePIN Mesh

Oracle data & telecom bandwidth

75% – 88% margin



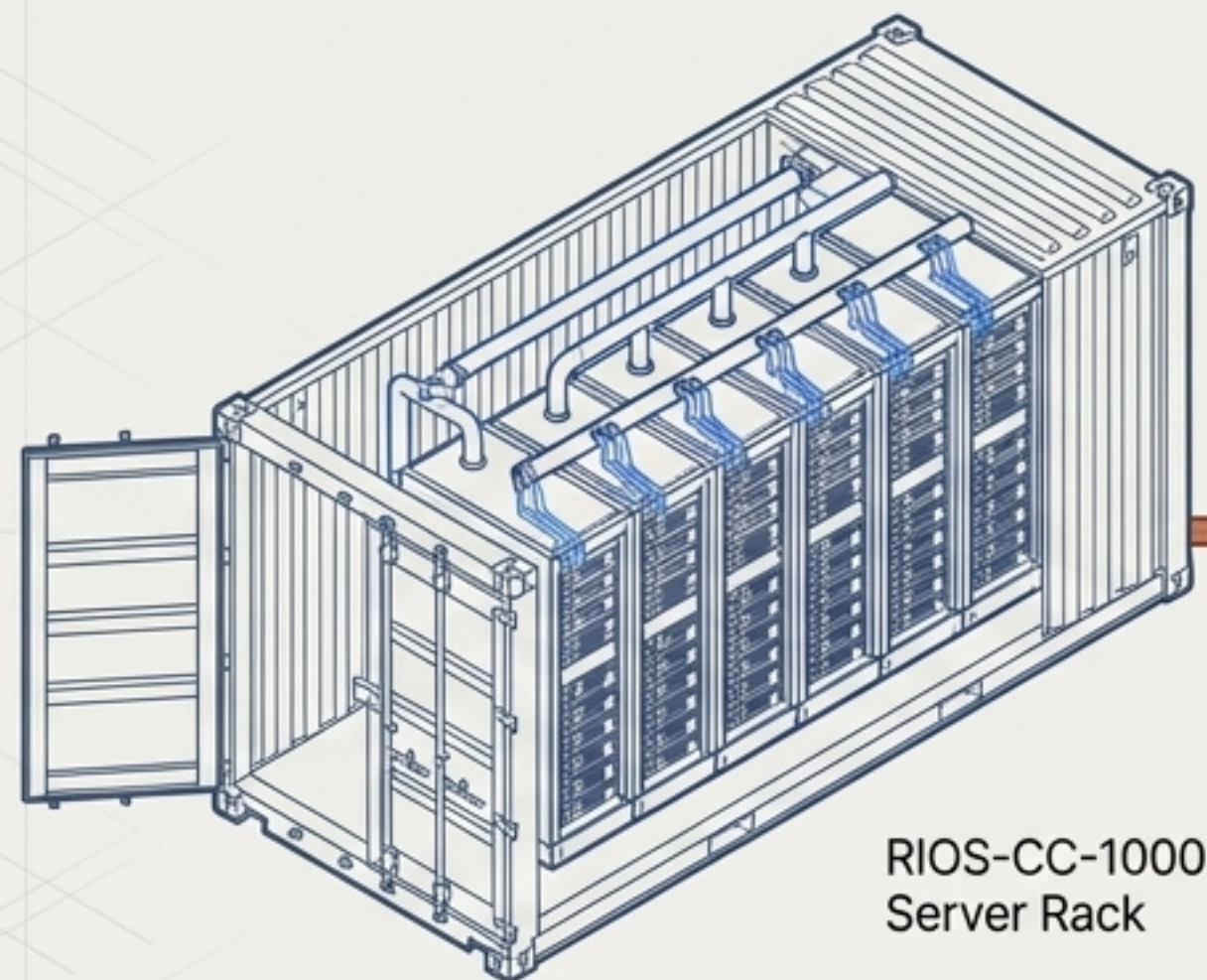
6. Venture Studio

Turnkey Node franchising

70% – 85% margin

Converting captive biomass power directly into high-margin compute capacity.

Profit Center 1: Behind-the-Meter AI Compute

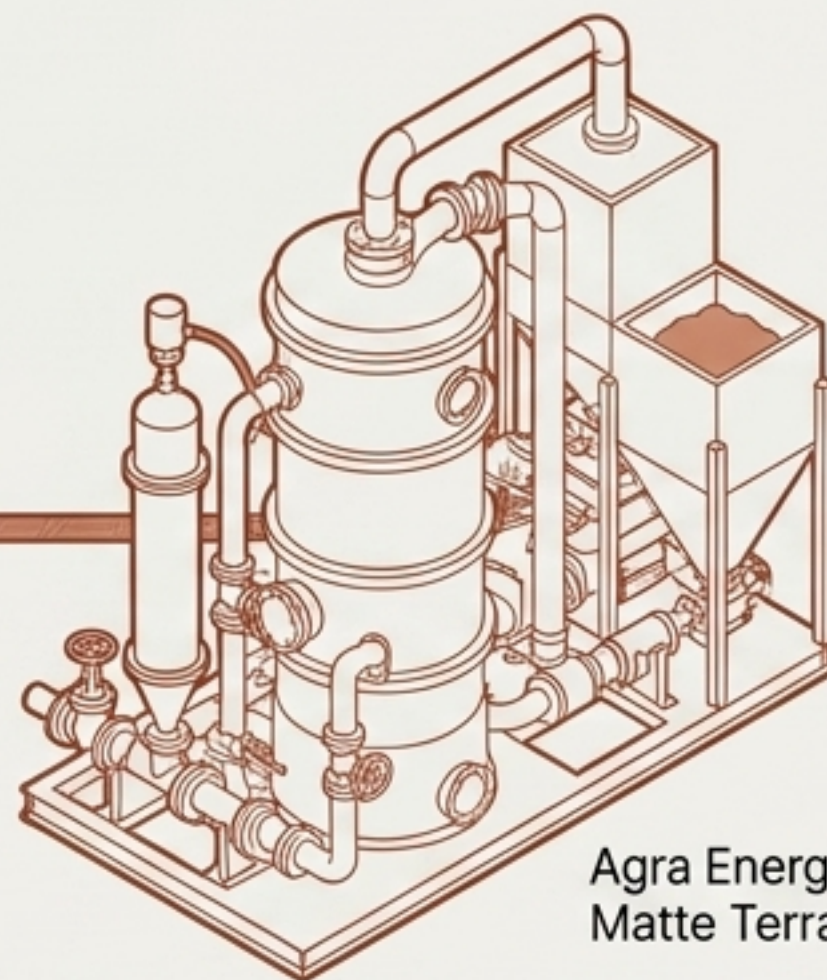


700V DC Bus
(Power Transfer)

RIOS-CC-1000
Server Rack

Monetizes on-site generated power by converting it into high-value FLOPs.
A single 1.2 MW module (1,024 NVIDIA H100 equivalents) generates \$18.7M/yr gross revenue via CaaS contracts and batch inference at 95% uptime.

Profit Center 2: Agra Energy Plasma Gasification

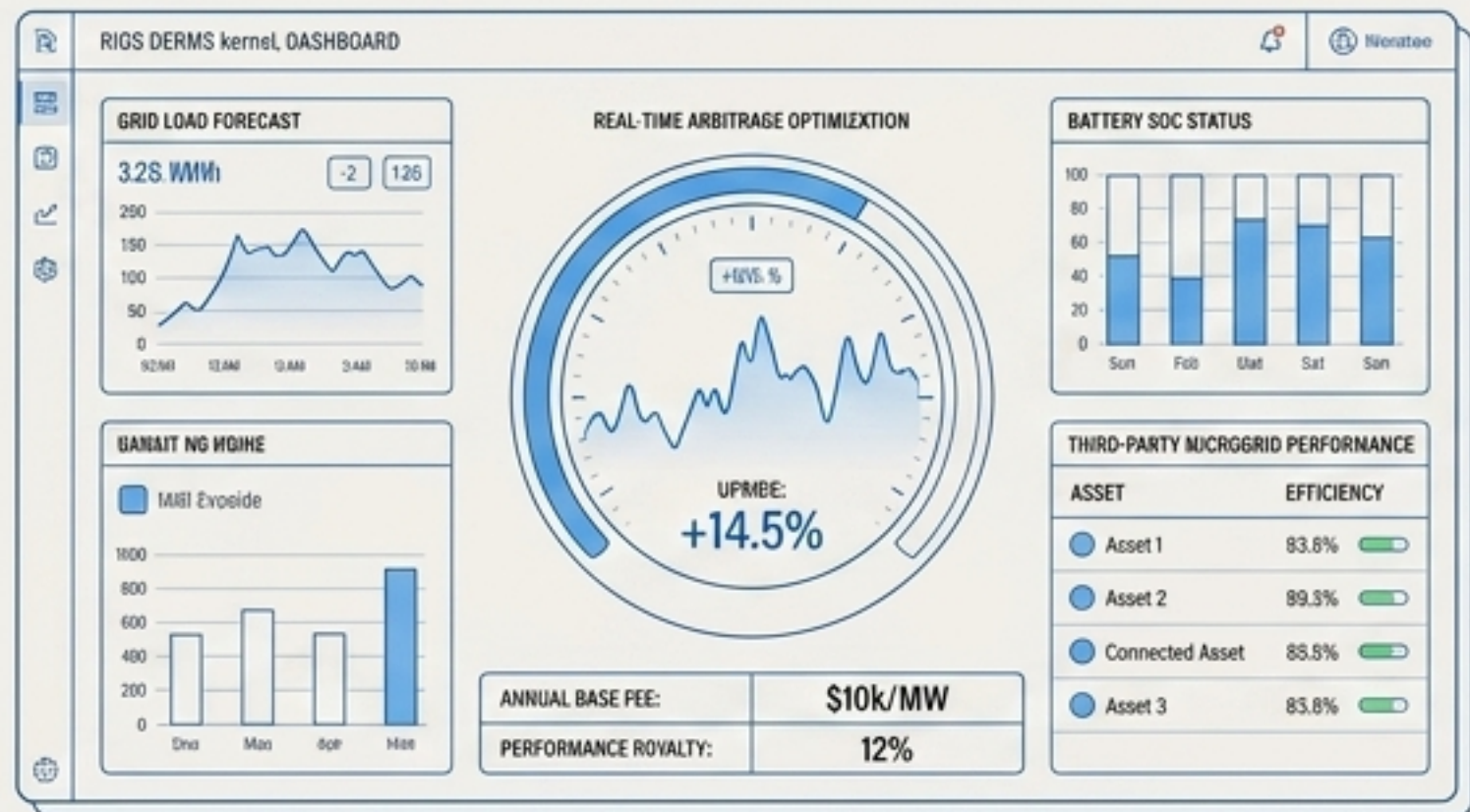


Agra Energy Gasifier,
Matte Terracotta

Supplies internal prime power at a fixed rate of \$0.038/kWh.
Generates secondary revenues through high-grade agricultural biochar sales (\$350/ton) and Carbon-Consuming Circular Economy V3 (CCCE) credits.

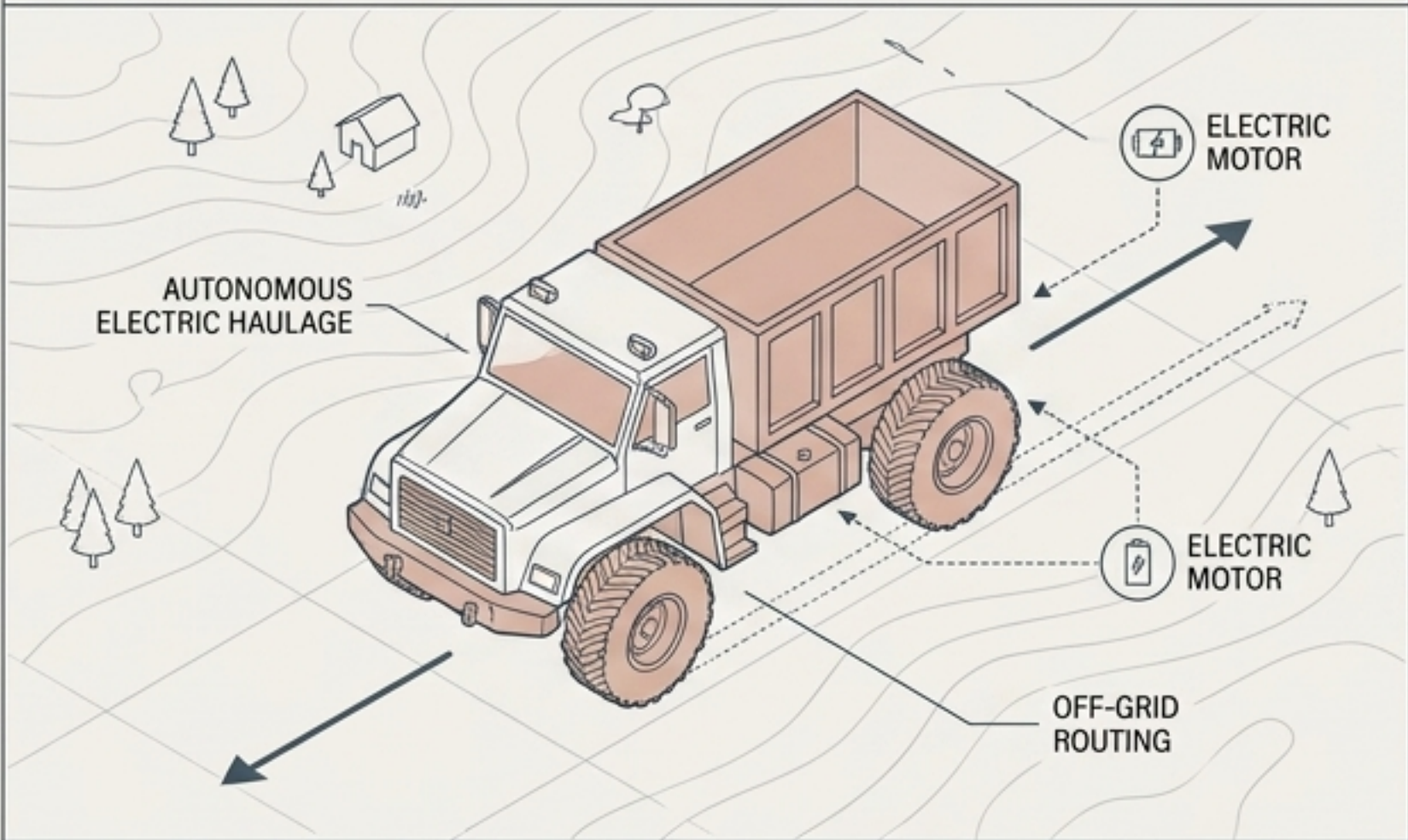
Monetizing proprietary orchestration software and autonomous rural logistics.

Profit Center 3: RIOS Software Licensing.



Commercializing the AI DERMS kernel as an enterprise SaaS. Deploys a \$10k/MW annual base fee plus a 12% performance royalty on the arbitrage upside generated for third-party microgrids.

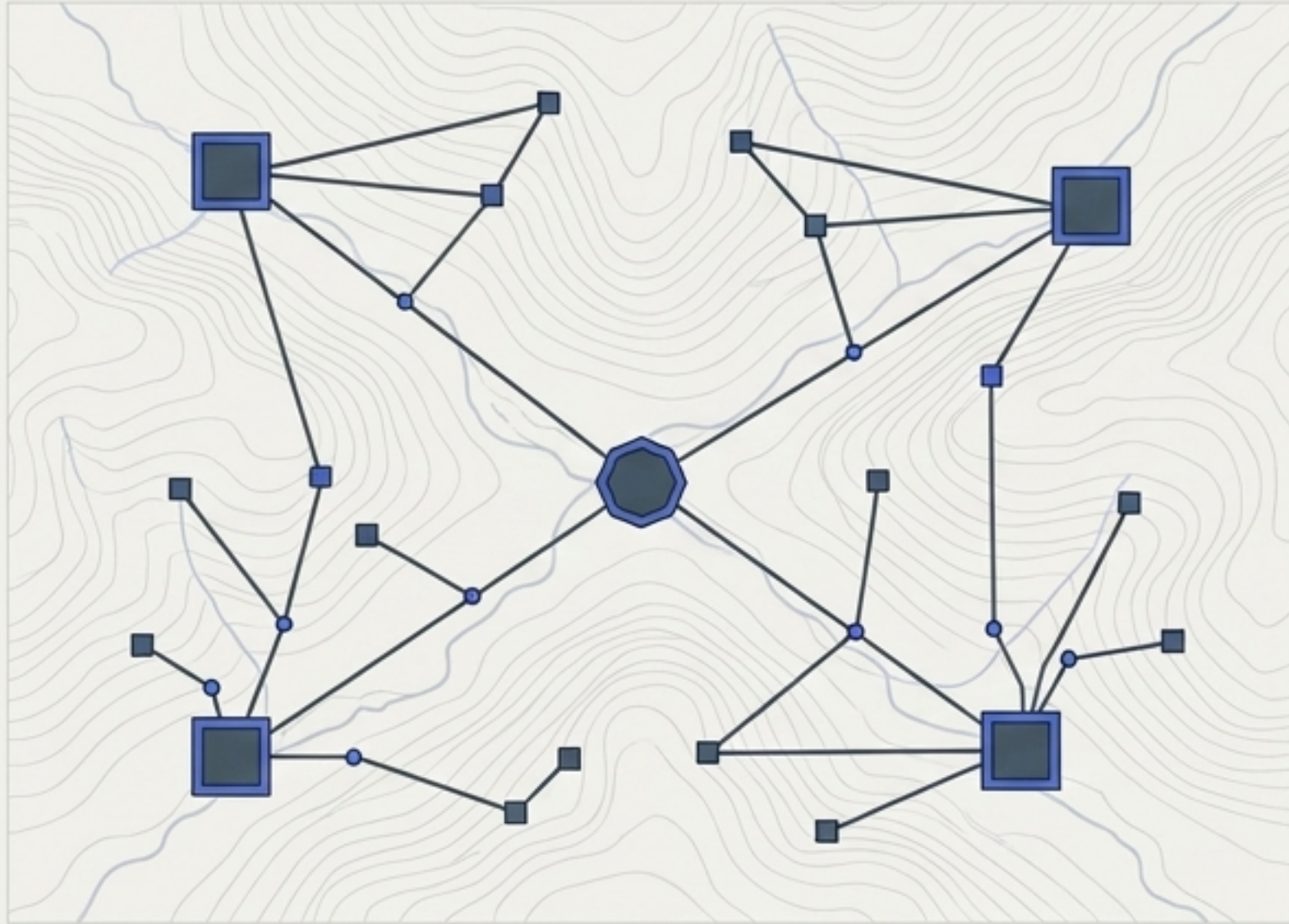
Profit Center 4: Kurb Kars Autonomous Mobility.



Slashes internal biomass haulage overhead from \$0.35/ton-mile (diesel) to \$0.12/ton-mile (off-grid electric). Monetizes excess fleet capacity by providing autonomous rural freight services for regional timber operators.

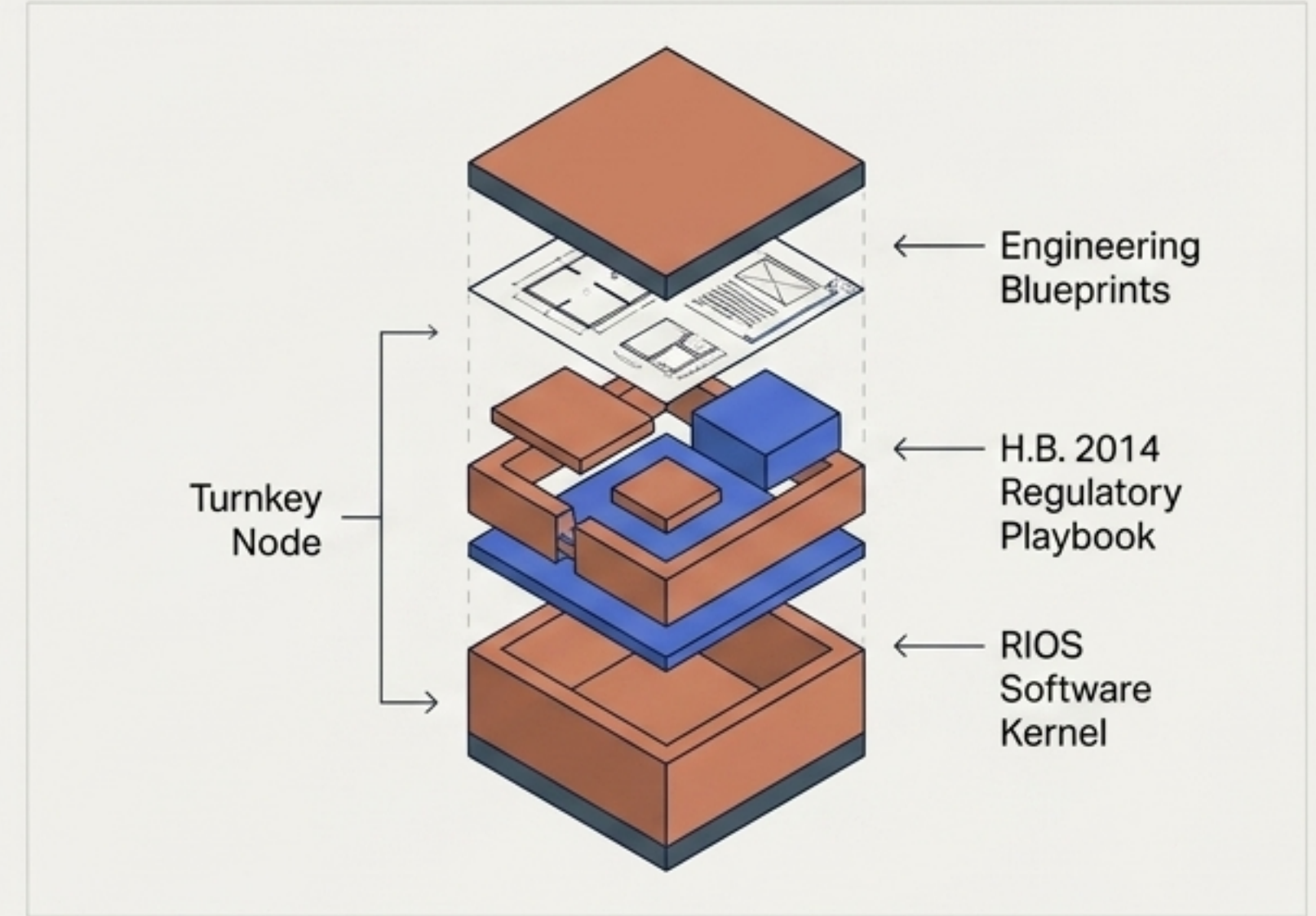
Scaling decentralized data networks and turnkey facility licensing.

Profit Center 5: DePIN Mesh Communications.



Charging institutional ESG auditors for cryptographically signed, hardware-verified oracle data. Simultaneously generates recurring revenue by selling sub-GHz broadband bandwidth to rural industrial operators in cellular dead zones.

Profit Center 6: Venture Studio Franchise IP.



Packaging the engineering blueprints, RIOS software, and H.B. 2014 regulatory playbook into turnkey Sovereign Node franchises. Commercialized via a \$1.5M upfront architecture fee plus a 5% ongoing revenue royalty.

A \$33.2M initial CapEx yields an unlevered payback period of just 7.4 months.

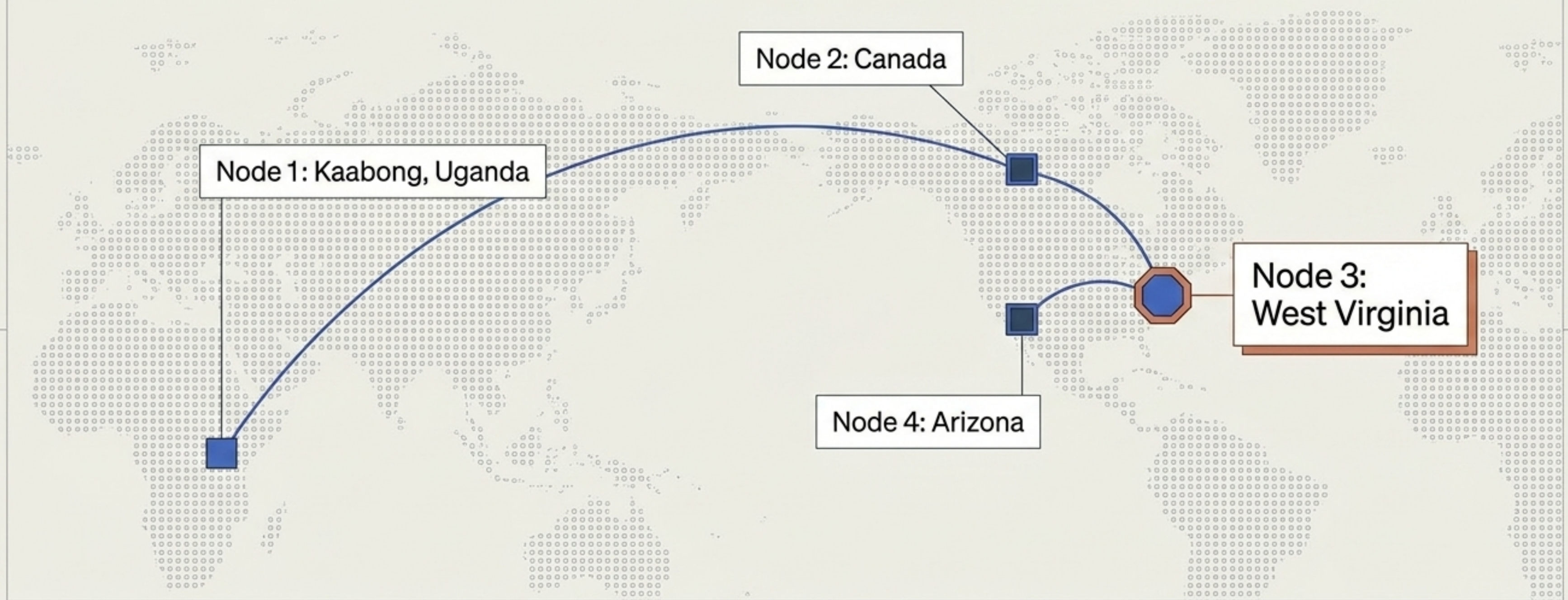
Project Octagon Node 3 (10 MW) CapEx	\$33.2M
Annual EBITDA (Year 2, Fully Scaled)	\$53.5M
EBITDA Margin	89.5%
Unlevered IRR	142%

Payback Period vs. Biomass Cost

		Biomass Cost (\$/ton)		
X-Axis		\$25	\$35	\$50
Y-Axis Payback Period		< 8 months	< 8 months	< 8 months

Supply Chain Resilience: Because energy inputs represent a minor fraction of GPU compute revenue, a massive 42% increase in biomass feedstock costs (\$35 to \$50/ton) extends the payback period by less than 8 days.

Validating the Sovereign Stack across diverse geopolitical and climatic environments.



Project Octagon is a global network of eight strategic sovereign infrastructure nodes.

West Virginia operates as Node 3: The primary North American R&D anchor. It serves as the definitive showcase for state legislators, federal regulators, and industry partners seeking proven models for behind-the-meter AI infrastructure.

Aligning industrial edge deployment with West Virginia University research mandates.

NSF RETI Consortium 4 Research Pillars directly mapped to DeReticular Sovereign Stack capabilities.

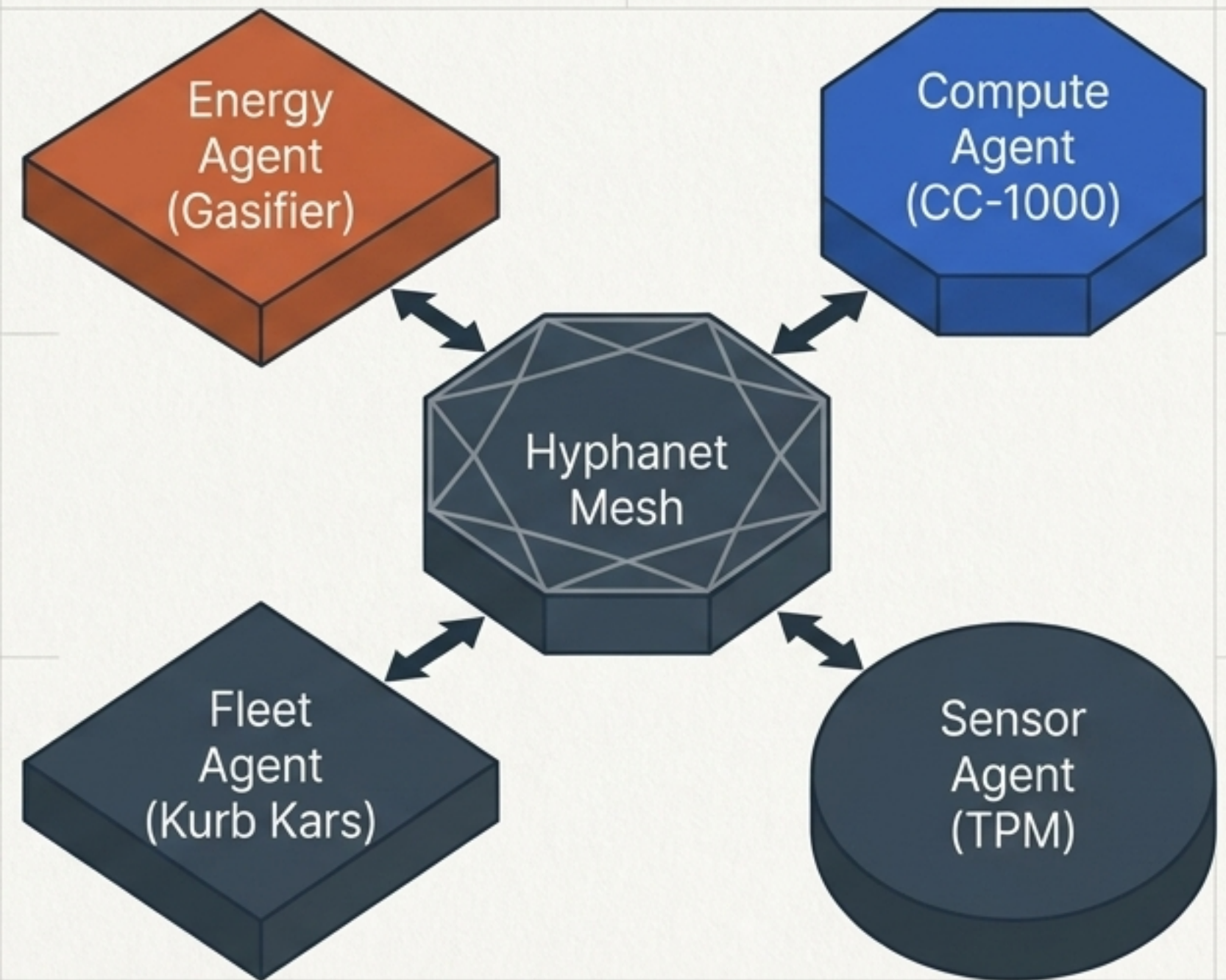
Pillar 1: Grid Edge Resilience	Pillar 2: AI Power Strain	Pillar 3: Cybersecurity	Pillar 4: Commercialization
Executed by the RIOS Autonomous DERMS managing multi-fuel microgrids in Island Mode.	Resolved by the RIOS-CC-1000 behind-the-meter compute clusters offloading RTO grids.	Validated by DeReticular’s deployment of TPM 2.0 cryptographic hardware and Sysbox container isolation.	Accelerated by DeReticular’s Venture Studio, driving regional startup creation and economic impact.

Enabling WVU researchers to evaluate autonomous microgrid coordination in real-time.

In collaboration with the WVU Statler College of Engineering, Node 3 features an Agent-to-Agent (A2A) Outdoor Proving Ground.

Graduate researchers will utilize this campus to evaluate peer-to-peer software coordination, test hardware-secured oracles, and validate biomass-to-energy conversion efficiencies.

Software agents autonomously negotiate power pricing, dispatch logistics fleets, and verify environmental data, creating a living laboratory for decentralized infrastructure.



Distributing software authority and physical resilience testing across two regional hubs.

Hub A: Morgantown (The Mind)

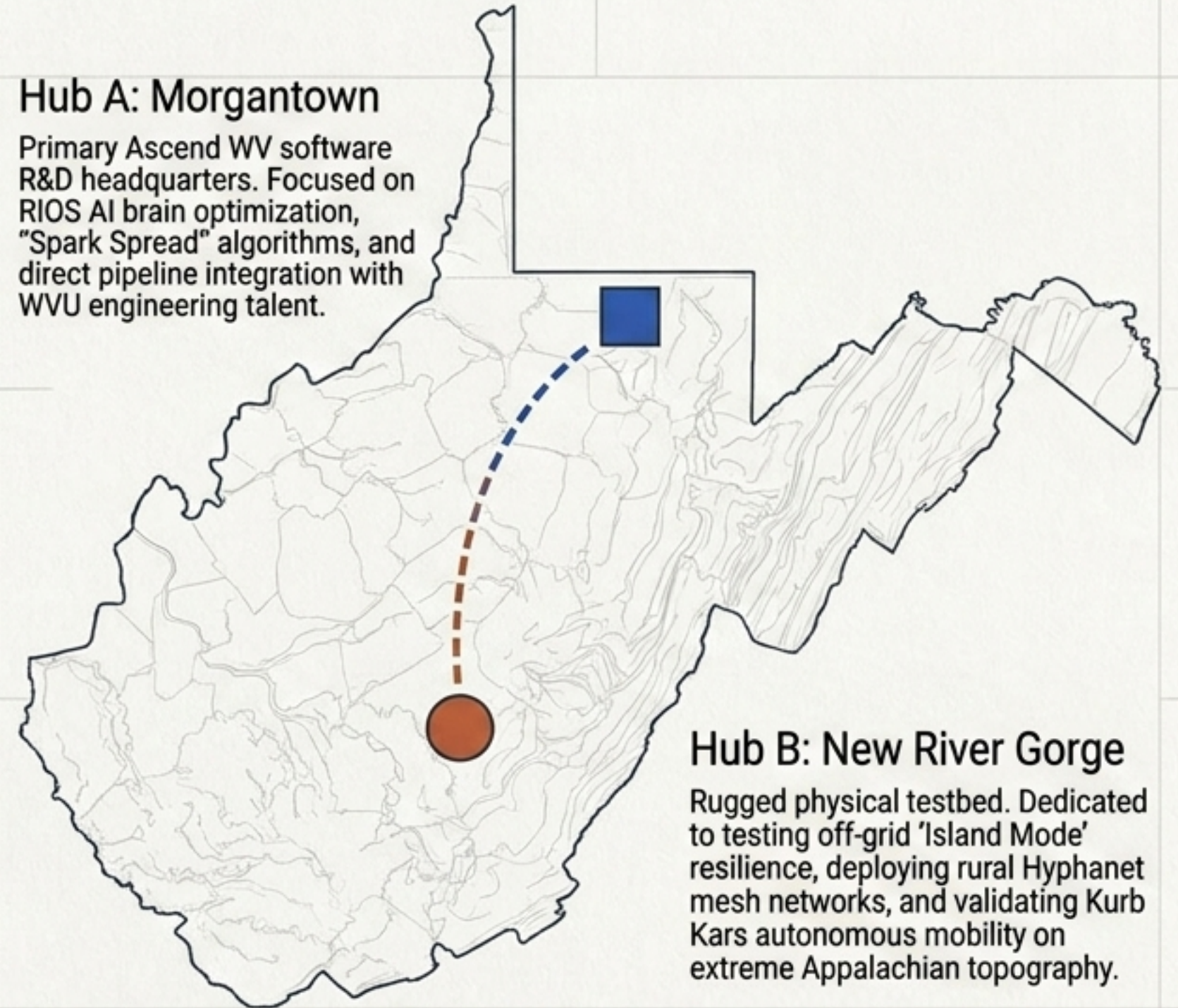
- ❖ Focused on RIOS AI brain optimization, “Spark Spread” algorithms, and direct pipeline integration with WVU engineering talent.

Hub B: New River Gorge (The Muscle)

- ❖ Dedicated to testing off-grid ‘Island Mode’ resilience, deploying rural Hyphanet mesh networks, and validating Kurb Kars autonomous mobility on extreme Appalachian topography.

Hub A: Morgantown

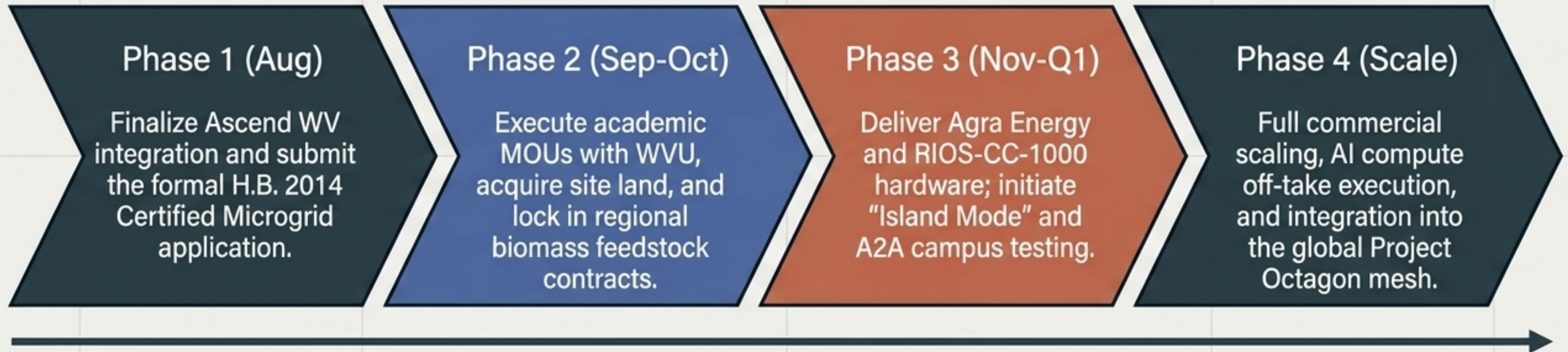
Primary Ascend WV software R&D headquarters. Focused on RIOS AI brain optimization, “Spark Spread” algorithms, and direct pipeline integration with WVU engineering talent.



Hub B: New River Gorge

Rugged physical testbed. Dedicated to testing off-grid ‘Island Mode’ resilience, deploying rural Hyphanet mesh networks, and validating Kurb Kars autonomous mobility on extreme Appalachian topography.

Four synchronized phases to activate Node 3 and initiate commercial operations



For institutional inquiries and execution partnership: Michael Noel, Founder & Chief Systems Architect (www.dereticular.com)