

95-02-D Strawman for National AI Infrastructure Governance

Every Critical Infrastructure Eventually Requires Governance

History suggests a recurring pattern. Whenever a new form of infrastructure becomes essential to civilization, society eventually develops institutions to govern it.

- Electricity gave rise to public utility commissions.
- Civil aviation gave rise to air traffic authorities.
- Banking gave rise to central banks and financial regulators.
- Telecommunications gave rise to communications commissions.
- The Internet evolved standards bodies, certificate authorities, and global governance organizations.
- As autonomous cognition becomes foundational to governments, enterprises, militaries, and critical infrastructure, a similar institutional evolution may occur.

The hierarchy presented here is one possible conceptual model for how governance of large-scale AI infrastructure could evolve.

Layer 0 – Department of Energy

In the United States, one possible institutional model would place the Cognitive Utilities Commission (CUC) under the U.S. Department of Energy (DOE), analogous to how the North American Electric Reliability Corporation (NERC) develops and enforces reliability standards for the bulk electric system under federal oversight. The rationale is architectural rather than technological. Just as electricity evolved from a commercial product into critical national infrastructure requiring continuous reliability engineering, autonomous cognition may evolve into critical cognitive infrastructure requiring continuous stability engineering. The Department of Energy already possesses decades of institutional experience governing complex, interconnected utility-scale systems where stability, resilience, cascading failures, and public reliability are paramount. Under this model, the CUC would become the national authority responsible for establishing Cognitive Grid reliability standards, Zero Trust Cognition requirements, stability certification, interoperability, and incident oversight, while licensed GUDIYA Grid Operators would remain responsible for day-to-day operation of the nation's cognitive infrastructure. In this vision, the DOE's mission expands naturally from safeguarding the nation's energy infrastructure to safeguarding its future cognitive infrastructure.

Layer 1 — Cognitive Utilities Commission (CUC)

Governance & Regulation

At the highest level sits an independent governance authority.

Its purpose is not to operate cognitive infrastructure.

Its purpose is to govern it.

Much like a Public Utilities Commission oversees electrical utilities without generating electricity itself, the Cognitive Utilities Commission establishes the principles under which Cognitive Grids operate.

Possible responsibilities include:

- Cognitive stability standards
- Zero Trust Cognition regulations
- Grid neutrality requirements
- Public safety policies

- Certification frameworks
- Cross-border interoperability standards
- Audit and oversight
- Incident investigation
- Public trust

The Commission represents the public interest.

It ensures that the Grid remains safe, transparent, interoperable, and cognitively neutral.

Layer 2 — GUDIYA Grid Operators

Operating the Cognitive Grid

The second layer consists of licensed Grid Operators.

These organizations are responsible for operating the Cognitive Grid itself.

Their responsibilities resemble those of modern electric utilities or network ISO operators.

Rather than producing cognition, they maintain the stability of cognition.

Responsibilities may include:

- Continuous Grid operation
- Stability monitoring
- Capacity management
- Cognitive telemetry
- Grid resilience
- Fault isolation
- Cross-region synchronization
- Emergency stabilization

Their responsibility is operational excellence.

The Commission establishes the rules. The Operators execute them.

Layer 3 — STABEX Platform Exchange

The Cognitive Marketplace

Between governance and execution sits an economic coordination layer.

The Stability Exchange (STABEX) enables organizations to discover, acquire, provision, and economically coordinate cognitive stabilization services.

Possible marketplace functions include:

- Discovery
- Capacity matching
- Service procurement
- Dynamic pricing
- Contracts
- Service-level agreements
- Transparency
- Settlement

Just as financial exchanges coordinate capital markets, STABEX coordinates the market for cognitive stability. It becomes the commercial ecosystem surrounding the Grid.

Layer 4 — Cognitive Stability Environments (CSEs)

Regional Stabilization Infrastructure

Cognitive Stability Exchanges represent the distributed stabilization fabric of the Grid.

Each exchange continuously monitors, routes, and stabilizes cognition flowing through its region.

Their responsibilities may include:

- Stability envelope enforcement
- Cognitive routing
- Load balancing
- Isolation
- Recursive stabilization
- Containment
- Observability
- Failover
- Recovery

Rather than executing AI workloads, CSEs preserve their stability. They form the "transmission network" of cognition.

Conceptually it is feasible that Hyperscalers may operate CSE data centers collocated with their CEE data centers. This co-location borrows the experience from Wall Street Stabilization data centers for machine speed algorithmic trading.

Layer 5 — Cognitive Execution Environments (CEEs)

Where Cognition Executes

Cognitive Execution Environments are the runtime environments in which autonomous cognition actually executes.

Examples might include:

- AWS CEE
- Azure CEE
- Google CEE
- Anthropic CEE
- OpenAI CEE
- Enterprise CEEs
- Government CEEs
- Military CEEs
- Sovereign National CEEs

The CEE becomes the cognitive equivalent of today's cloud computing environment. Instead of merely executing software, it executes populations of autonomous cognitive actants. Conceptually these become the Cognition Stadiums.

Responsibilities include:

- Secure execution
- Resource management
- Isolation
- Policy enforcement
- Runtime observability
- Auditability
- Measurable execution

Every Cognition Stadium ultimately executes inside one or more CEEs.

Layer 6 — Actants

Producers and Consumers of Cognition

At the foundation of the hierarchy reside the participants themselves.

These are the entities that generate, consume, and exchange cognition.

Examples include:

- AI Agents
- APIs
- SaaS Platforms
- Robots
- Autonomous Vehicles
- Humans
- Sensors
- Industrial Control Systems
- Military Platforms
- Enterprise Applications

The Actants represent the visible face of autonomous computing.

Yet their behavior increasingly depends upon every layer above them.

The Layered Separation of Responsibilities

An important architectural principle emerges from this hierarchy.

Each layer has a distinct responsibility.

Layer	Primary Responsibility
Cognitive Utilities Commission	Governance and public oversight
GUDIYA Grid Operators	Grid operations and stability
STABEX	Economic coordination
Cognitive Stability Exchanges	Stabilization and routing
Cognitive Execution Environments	Runtime cognition execution
Actants	Autonomous decision making

Each layer specializes.

None attempts to perform every function.

This separation resembles other mature infrastructures such as electricity, aviation, and telecommunications.

Public Trust Through Institutional Separation

- Separating governance from operations creates institutional trust.
- The regulator does not operate the Grid.
- The Grid Operator does not regulate itself.
- The marketplace does not define public policy.
- The execution environment does not certify neutrality.
- Each institution provides an independent check on the others.

This separation is one mechanism by which society has historically balanced innovation with accountability.

A Foundation for Cognitive Infrastructure

Whether future AI infrastructure evolves exactly along these lines is uncertain.

Different nations, industries, and organizations may adopt different governance models.

However, the broader architectural principle is likely to endure:

As cognition becomes critical infrastructure, governance, operations, markets, stabilization, execution, and participation will increasingly become distinct institutional responsibilities.

The visual hierarchy represents one possible evolution toward that future.

Final Thought

- The industrial age required governments to regulate the movement of electricity.
- The information age required institutions to govern the movement of information.
- The age of autonomous cognition may require something new:
 - Institutions capable of governing the safe, neutral, and stable movement of cognition itself.
 - If that future arrives, AI infrastructure will no longer be viewed merely as software.
 - It will be recognized as public infrastructure—requiring governance, operational stewardship, economic coordination, continuous stabilization, trusted execution, and ultimately the confidence of the societies that depend upon it.

