SYNC 3.0 — Terminal Governance Layer

Hardened 9-Model Consensus Audit for Municipal Pilot Authorization

Version	TGL-Only Final Municipal / Public-Power Authorization Brief
Date	2026-06-29
Source Basis	Derived from nine Terminal Governance Layer audits dated June 29, 2026
Primary Audience	Municipal utilities, public-power boards, city councils, regulators, water authorities, and public counsel
Pilot Context	Localized containment of one 50 MW compute node within a 300 MW aggregate municipal / zonal compute ceiling
Host Jurisdiction Assumption	Municipal / public-power entity exercising land-use, franchise, and retail interconnection authority outside FERC-style retail / wholesale preemption risk

This standalone engineering-and-policy handoff document isolates the Terminal Governance Layer from the broader SYNC 3.0 suite and presents it as a final municipal/public-power pilot authorization brief. The merged consensus is that the TGL materially hardens the local governance model by replacing two flawed

mechanisms with physically enforceable and legally durable controls. The result is a finite, bounded, net-positive utility node model for localized containment — strong for municipal implementation, but not by itself a complete answer to global compute leakage outside the host jurisdiction.

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Executive Summary and Verdict Matrix

The nine-model consensus supports a cautious but affirmative municipal conclusion: the Terminal Governance Layer is legally and operationally sound for localized containment when implemented exactly inside a municipal / public-power host jurisdiction. Its function is not to make a data center “greener” in narrative terms. Its function is to convert a 50 MW compute facility from an expandable extraction platform into a finite, bounded, net-positive municipal utility node.

Question	Consensus Finding	Disposition
Is the TGL legally coherent for a municipal / public-power host?	Yes, when framed as land-use, capacity entitlement, zoning, franchise, and municipal utility governance rather than electricity-consumption taxation.	**Supportable**
Does it close the two prior architectural defects?	Yes. The efficiency-linked tax is replaced by a capacity-keyed impact fee; the freed-MW rebate is replaced by a refresh-triggered ratchet.	**Closed**
Can it physically constrain the node without executive override?	Yes, if authority terminates in Level-1 safety logic, breaker-trip control, and hardened local interlocks rather than policy text alone.	**Executable**
Does it solve global compute leakage?	No. It is strong for localized containment, not a complete solution to migration of load into unconstrained jurisdictions.	**Bounded Scope**
Is pilot authorization supportable?	Yes, but only under the specified jurisdictional assumptions, physical controls, and authorization conditions set out below.	**Conditionally Approvable**

> **Executive verdict:** The TGL is pilot-ready only as a municipal/public-power containment architecture. It is not a universal market design, not a

> generic private-sector growth framework, and not a substitute for wider policy diffusion.

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The Two Original Defects and Why the Revision Holds

Defect 1 — Efficiency-Linked Tax

The earlier efficiency-linked tax was structurally weak because it behaved too much like a charge on electricity use or efficiency behavior. It risked preemption analysis, misalignment with municipal utility authority, and it perversely taxed efficiency itself. The revised model replaces that mechanism with a **Permitted-Capacity Impact Fee** keyed to permitted or reserved MW, not metered kWh.

This matters because the fee is now treated as a land-use / infrastructure burden mechanism tied to capacity reservation rather than as an electricity-consumption price signal. The amount must be locally calibrated by a nexus study and should never be presented as a single universal fee figure for all jurisdictions.

Defect 2 — Mandatory Grid Rebate / Freed-MW Logic

The prior freed-MW or rebate logic rested on an unmeasurable counterfactual: how much capacity was “freed” by efficiency and should therefore be returned. That reopened rebound through workload inflation because operators could always claim that improved efficiency had simply been absorbed by increased work.

The revised model replaces that logic with a **Hardware Refresh Capacity Ratchet**. The cap falls by rule at refresh events or at a calendar backstop. No counterfactual must be measured. No narrative about “equivalent work” is required. The ratchet is monotonic-down and should be time-backed so that refresh avoidance cannot indefinitely delay contraction.

Why the revision holds: The revised architecture no longer depends on a tax on efficiency or a contested estimate of freed

capacity. It depends on municipal capacity entitlement, finite throughput, and physically enforced contraction.

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Five Hardened Guardrails

Guardrail	Function	Enforcement Basis	Pilot Rule
1. Absolute Capacity Cap	Fixes the node's maximum instantaneous power draw and denies expansion above the permitted envelope.	CUP, interconnection agreement, breaker-trip setpoint, Level-1 safety logic	50 MW hard cap physically enforced
2. Regional Density Limit	Prevents compute sprawl by bounding aggregate high-density compute within the host zone.	Zoning overlay, municipal queue closure, auditable capacity ledger	300 MW aggregate municipal / zonal ceiling
3. Permitted-Capacity Impact Fee	Charges for holding scarce reserved capacity rather than for consuming electricity.	Municipal ordinance, nexus study, utility / permit integration	Locally calibrated fee keyed to permitted MW, not kWh
4. Exhaustion Budget	Creates a finite lifecycle by capping cumulative throughput and emergency water usage.	Permit sunset condition, cumulative metering, Level-1 interlock	Reference pilot budget of 5.6 TWh and 50,000 L emergency-only water, counting all relevant pathways
5. Hardware Refresh Capacity Ratchet	Converts refresh cycles into public headroom by reducing the permitted cap over time.	CUP covenant, interconnection amendment, safety PLC cap table, validator governance	5–10% monotonic-down reduction per refresh cycle; default reference around 7% with 36-month backstop

The impact-fee level must be set by a local nexus study documenting infrastructure burden. The consensus does not support one universal fee amount across all municipalities. The pilot budget values above are preserved as reference thresholds only.

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Physical Enforcement Architecture and Jurisdiction Assumptions

Jurisdiction Assumptions

The integrated TGL assumes a host municipality or public-power utility exercising land-use, franchise, zoning, utility interconnection, and municipal utility governance authority outside the core FERC-style retail / wholesale preemption pathway that would make a consumption-based electricity charge more vulnerable.

The legal framing is therefore municipal and proprietor-like: capacity entitlement allocation, public-system protection, permit conditions, and local infrastructure burden — not wholesale energy regulation.

Physical Enforcement Assumptions

- Level-1 safety logic, SIL-3 or equivalent where required by the host engineering standard.
- Breaker-trip authority and ANSI 86 lockout or equivalent protective architecture.
- No executive override, no cloud dependency, and no SCADA write-path to increase caps or reset exhaustion budgets.
- Metering boundary includes grid import, on-site generation, BESS discharge, and relevant water inputs.
- Validator / key ceremony and auditable ledger governance for state changes.

> **Executive-proof clarification:** The TGL is “executive-proof” only insofar as authority terminates in physically enforced municipal controls rather than policy text alone. A ledger may document. A breaker interlock enforces.

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Pilot Authorization Conditions

Condition	Why It Exists	Required Status
Adopt 300 MW density ceiling ordinance	Prevents compute sprawl and closes the zonal queue at the local planning layer	**Required before authorization**
Record 50 MW cap and TGL obligations in CUP / permit	Makes the cap, budgets, and ratchet run with the project approval and land-use posture	**Required before authorization**
Interconnection agreement prohibits expansion above permitted cap	Prevents later attempts to reopen growth through administrative reinterpretation	**Required before energization**
Certified safety logic and sealed breaker / switchgear enforcement	Ensures the architecture is physically enforceable, not merely administratively documented	**Required before energization**
3-of-5 validator / key ceremony and auditable ledger governance	Prevents unilateral cap or budget manipulation and provides institutional evidence	**Required before energization**
Nexus study for fee calibration	Anchors the impact fee to actual infrastructure burden and supports legal defensibility	**Required before ordinance finalization**
Municipal / public-power legal opinion	Confirms jurisdictional authority, land-use posture, and municipal utility implementation path	**Required before authorization**
Tested curtailment and rebound-control procedures	Prevents a nominal cap from becoming an operational fiction during stress events	**Required before energization**
Decommission / restoration assurance	Ensures the finite-lifecycle model is real and not dependent on operator goodwill	**Required before energization**

Condition	Why It Exists	Required Status
Public dashboard / transparency provisions where adopted	Supports public legitimacy, municipal oversight, and continued-operation accountability	**Strongly recommended / jurisdictional**
Time-floor backstop for ratchet	Prevents indefinite delay of contraction by simply refusing to refresh hardware	**Required in the ratchet schedule**

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Legal Posture, Limits of the Model, and Final Sign-Off

Legal Posture

The TGL is strongest when framed as a municipal / public-power structure grounded in local land-use and capacity entitlement governance. The Permitted-Capacity Impact Fee should be adopted as a locally calibrated impact-fee mechanism tied to documented infrastructure burden, not as a volumetric electricity charge. The Hardware Refresh Capacity Ratchet should be written as a monotonic-down permit and interconnection condition tied to observable refresh cycles and a 36-month backstop.

Limits of the Model

The integrated TGL is strong for localized containment. It is not, by itself, a complete answer to global compute leakage outside the host jurisdiction. If unconstrained jurisdictions absorb displaced load, the broader macroeconomic rebound problem persists. This is a policy-diffusion issue rather than a defect in the localized containment model itself.

Final Sign-Off

Pilot authorization is supportable only under the specified jurisdictional and enforcement assumptions: a municipal / public-power host, physically enforceable Level-1 controls, a capacity-keyed fee calibrated by nexus study, lifecycle budgets that include all relevant throughput, and a monotonic-down ratchet that cannot be defeated by refresh delay.

Final policy conclusion: The integrated Terminal Governance Layer materially strengthens the municipal brief for pilot authorization by converting general governance intent into a bounded local containment regime. It is supportable for municipal pilot authorization only where public-power authority,

> physical enforcement, and ordinance-level durability are all present together.

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