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Can Public Agencies Capture "Price-Signal" Feedback?

Designing Market-Like Mechanisms Without Becoming a Market

1 Why Price Signals Matter

- **Instant feedback loop** In private markets, rising or falling prices tell firms whether resources are scarce, demand is shifting, or quality is mis-aligned.
- **Distributed intelligence** No central planner has to collate every datapoint—millions of transactions aggregate local knowledge into a single, comparable metric.
- **Evolutionary pressure** Firms that misread signals lose margin or market share; those that respond quickly scale up, creating continual performance pressure.

Public water and infrastructure agencies rarely "see" those signals because:

1. **User fees are politically capped**; they do not float with real-time demand or risk.
2. **Budget cycles are annual or bi-annual**, muting short-run feedback.
3. **Success metrics are compliance-oriented** (e.g., pass/fail permits), not value-oriented (e.g., marginal cost per risk-unit reduced).

2 Surrogates for Market Feedback

Below are proven or emerging tools that replicate *parts* of the price-signal function without fully privatizing the service.

Surrogate Mechanism	How It Works	Water-Sector Examples	Feedback Strength
Performance-Based Budgeting	A share of the operating budget (or executive bonuses) is tied to outcome metrics, not inputs.	UK regulator **Ofwat's "Outcomes Delivery Incentives"** reward/penalize utilities £ per customer-indexed KPI variance.	Medium
Shadow Pricing ("Internal Tariffs")	Finance teams assign notional costs to activities (energy, chemicals, downtime). Crews see the "bill" even if no cash moves.	Singapore PUB's plants track *avoided kWh* savings as a pseudo-revenue line; teams can reinvest the credit.	Medium–High
Pay-for-Performance Contracts (ESCO / EPC)	Third-party firm funds upgrades; agency pays only from verified savings or risk reductions.	160+ U.S. water facilities have energy-service contracts; cumulative guaranteed savings >$500 M.	High on targeted KPIs
Tradable Permits / Cap-and-Trade Analogues	Regulator sets a cap (e.g., nutrient discharge) and issues permits that agencies can trade; the permit price becomes a *scarcity index*.	Chesapeake Bay Watershed nutrient credit trading saves some utilities 50% vs. plant-only upgrades.	High but scope-limited

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Competitive Benchmarking & League Tables	Publish standardized cost-and-service data; reward top quartile or penalize laggards.	Netherlands' water boards publish annual efficiency scores; laggards lose a slice of future capital grants.	Medium
Outcome-Based Grants	Federal or state funds flow **after** targets (leak reduction, PFAS removal) are verified.	U.S. EPA's WIFIA now pilots "milestone-based draws" that release funds only after sensor-verified progress.	Medium
Digital "information markets"	Open dashboards where citizens up-vote priorities or pledge micro-payments for improvements, creating a demand-reveal signal.	Taipei's *vTaiwan* platform influenced storm-drain spending, ranking projects by public willingness-to-pay.	Low today, rising

3 Design Principles for Effective Surrogates

1. **Tie stakes to controllable outcomes** – link rewards/penalties to metrics field staff can influence (energy per m^3, leak-hours closed).
2. **Make the "price" visible fast** – dashboards, weekly scorecards, or even shift-end texts keep latency low.
3. **Embed guardrails against gaming** – pair each primary KPI with a *counter-metric* (e.g., energy savings **and** water-quality complaints).
4. **Adjust the coefficient, not the metric** – if incentives misfire, change the reward rate rather than adding more KPIs.
5. **Start with a pilot and escrow** – hold bonuses/penalties in escrow during Year 1 to debug data quality before cash changes hands.

4 Potential Pitfalls

- **Perverse incentives** if KPIs are too narrow (e.g., minimizing chemical cost while biofilm risk rises).
- **Equity concerns** when outcome-based grants steer money away from disadvantaged areas that start further behind.
- **Measurement error** that erodes trust; invest early in sensor QA/QC and third-party verification.
- **Political blow-back**; frame incentives around *public value* ("dollars saved = more budget headroom for lead-line replacements").

5 Quick-Start Checklist for Agency Leaders

1. **Map today's informal price signals** (energy bill spikes, emergency overtime, customer complaints).
2. **Select one high-spend pain point** (e.g., non-revenue water) and design a *shadow price* every team can see daily.

3. **Layer a small bonus pool** (≤2% of O&M) tied to verified improvements; publish standings monthly.
4. **Invite external challengers**—run a reverse auction for leak detection or biosolid hauling to generate a reference price.
5. **Review in 12 months**; expand only metrics that drove behavior without unintended harm.

6 Key Takeaway

Public agencies will never replicate the full spontaneity of open markets—but they **can** borrow the market's sharpest feature: *continuous, consequence-aligned feedback*. By embedding surrogate price signals—performance-based budgets, shadow tariffs, tradable credits—utilities gain the evolutionary pressure private firms live with every day, without surrendering public-interest mandates.

Ofwat, "PR19 Outcomes Framework," 2020
U.S. Department of Energy, "Energy Savings Performance Contracts in Water and Wastewater Facilities," 2023
Chesapeake Bay Commission, "Nutrient Credit Trading Study," 2022