Appendix A: The Four Pillars of Strategy Design — Working in Sync

Think in Systems.
Trade with Discipline.

Quant power doesn’t live in one model but in the coordination of four:

- **Forecasting**
  → Directional signals across 12,500+ hubs × 24 hours
- **Risk Assessment**
  → Downside quantified per (hub, hour) if the forecast is wrong
- **Position Sizing**
  → Capital and risk appetite translated into MWh per trade
- **Historical-Forward Optimization**
  → 1,000s of alternate market realities tested before capital is deployed

Together, they form the core of disciplined strategy design —
Not just what to bet on, but **how much**, **why**, and **with what risk**.

The result?
A disciplined, repeatable strategy that maximizes upside – while controlling downside.

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Appendix B: What Is a Flip-Over?

Flow reverses. Losses Begin

A Flip-Over is a sudden, coordinated reversal in DART spread direction across many hubs in a market region.

- Prices that were reliably higher in Day-Ahead markets abruptly fall behind Real-Time prices.
- Positions sized for typical regimes lose money rapidly as patterns break.
- Flip-Overs occur every 30–120 days per hour and can affect entire ISOs or large areas.
- Traditional forecasting models often miss early warning signals.

We detect Flip-Overs by analyzing multiple drivers:

- Hourly price and volatility patterns across hubs
- Weather and load forecast deviations impacting supply and demand
- Transmission constraints and shadow prices
- Regional outage forecasts and shifts in generation fuel mix
- Shifts in generation fuel mix

This multi-factor approach provides early, actionable alerts that help traders adjust strategies and manage risk before Flip-Overs strike.

Flip-Overs typically persist for 3–4 days before markets revert to their original regime.

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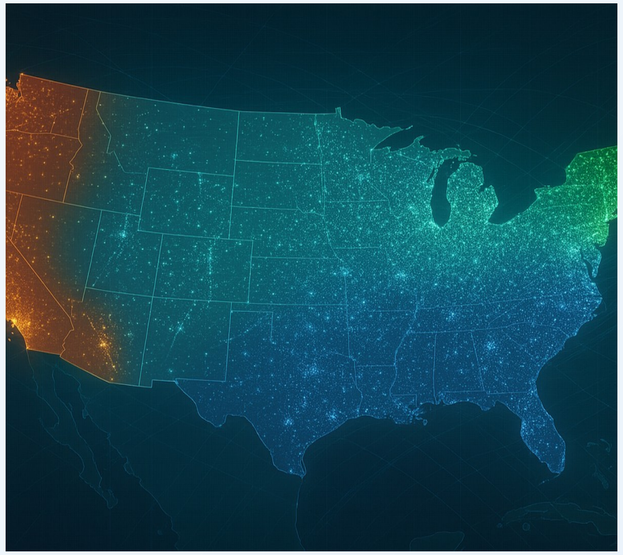
Appendix C: From Niche to Nation: TAM Unlocked

Market Tier	# Team Units	Avg Spend ($000s)	Opportunity ($mill)
Large Trading Desks (US)	800	$100k	$80M
Mid-SizeTrading Desks (US)	1,200	$40k	$48M
Small Trading Desks (US)	2,500	$10k	$25M
Large IPPs (US)	200	$125k	$25M
Upper Mid-Tier IPPs (5-15 plants + 2 desks, US)	300	$100k	$30M
Lower Mid-Tier IPPs (1-4 plants + 1 desk, US)	300	$50k	$15M
Small IPPs (US)	1,500	$5k	$7.5M
Large Munis & Co-ops (US)	1,000	$75k	$75M
Mid-size Munis & Co-ops (US)	1,500	$30k	$45M
Small Munis &Co-ops (US)	2,500	$10k	$25M
Large Retail Energy Buyers (US)	100	$150k	$15M
Mid-Size Retail Energy Buyers (US)	500	$50k	$25M
Small Retail Energy Buyers	1,000	$15k	$15M
Internal Add-on (Utilities & Traders)	1,600	$50k	$80M
International Core Accounts	400	$100k	$40M
International Small IPPs	1,000	$5k	$5M
Large IOUs/Vertically Integrated Utilities (US)	150	$150k	$22.5M
Mid-Size IOUs (US)	300	$50k	$15M
Small IOUs (US)	600	$15k	$9M
TOTAL TAM	---	---	$593,000,000/year

Thousands of Active Desks

Multiple Buyers per Org

High-Repeat Purchase Potential



U.S. Generator Footprint

Appendix D: TAM is the Dream, SOM is the Plan

Market Tier	TAM (Ann)	In/Out of SAM	SAM (Ann)	SOM (Ann)**	Justification for SOM %
Large Trading Desks (US)	$80 mill	In	$80 mill	$4 mill (5%)	Proven Need for Advanced Tools.
Mid-Size Trading Desks (US)	$48 mill	In	$48 mill	$3.4 mill (7%)	Underserved, strong automation needs.
Small Trading Desks (US)	$25 mill	In	$25 mill	$1 mill (4%)	Less budget, Need effective productization.
Large IPPs (US)	$25 mill	In	$25 mill	$1.3 mill (5%)	Slow. May try innovative tech to boost P&L.
Upper Mid-Tier IPPs (5-15 plants + 2 desks)	$30 mill	In	$30 mill	$1.8 mill (6%)	More open to experimentation.
Lower Mid-Tier IPPs (1-4 plants + 1 desk)	$15 mill	In	$15 mill	$1.2 mill (8%)	Lack quant capacity. High VPDaaS fit.
Small IPPs (US)	$7.5 mill	In	$7.5 mill	$0.4 mill (5%)	Large count, low ticket. Later priority.
Large Munis & Co-ops (US)	$75 mill	Out	---	---	Budget-constrained. Later priority.
Mid-Size Munis & Co-ops (US)	$45 mill	Out	---	---	Same as above
Small Munis & Co-ops (US)	$25 mill	Out	---	---	Same as above
Large Retail Energy Buyers (US)	$15 mill	In	$15 mill	$0.5 mill (3%)	Only a few truly-early adopters exist.
Mid-Size Retail Energy Buyers (US)	$25 mill	In	$25 mill	$0.8 mill (3%)	May engage through brokers or consultants.
Small Retail Energy Buyers (US)	$15 mill	In	$15 mill	$0.3 mill (2%)	Hard to reach directly. Low priority for now.
Internal Add-On Teams (Utilities & Traders)	$80 mill	In	$80 mill	$4 mill (5%)	May prefer VPDaaS to internal hires.
International Core Accounts (EU/LA/AUS)	$40 mill	In	$40 mill	$0.8% (2%)	Longer cycles, still early momentum possible.
International Small IPPs	$5 mill	Out	---	---	Low priority antil US is proven.
Large IOUs/Vertically Integrated Utils (US)	$22.5 mill	In	$23 mill	$0.7 mill (3%)	Large, bureaucratic but can be landmark clients.
Mid-Size IOUs (US)	$15 mill	In	$15 mill	$0.3 mill (2%)	Some openness to innovation; pilot candidates.
Small IOUs (US)	$9 mill	Out	---	---	Too small and slow to adopt in early stage.
Total	**$602 mill/yr**		**$443M/yr**	**$20.3 mill/yr**	

Thousands of Active Desks

Multiple Buyers per Org

High-Repeat Purchase Potential

U.S. Generator Footprint

Appendix E. Use of Funds:

Core Operating Spend (18-Month Phase I)

Planned. Scrutinized. Strategic.

Category	Purpose	Estimated Cost
Team Salaries	Founder + 3 Quants + Key fractional contractors	$1,280K
Data Acquisition	MISO public + optional proprietary datasets (YES/IIR)	$150K[1]
Cloud Compute (EC2)	Forecasting, simulation, diagnostics	$90K
Storage (S3 / RDS)	Model persistence, result archives	$25K
Dev / Quant Enablement	Laptops, LLM credits (ChatGPT, Claude), Ubuntu help, tooling	$30K
Design & Comms Stack	Client PDF generator, branding cleanup, email infra	$15K
Legal & Admin Ops	Incorporation, tax, Security & Compliance	$100K

| Total: Core Spend | | ~$1,690,000 |

[1] *Includes headroom for MISO data & early exploration of value-add proprietary signals (YES/IIR)*

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Appendix F. Use of Funds:

Strategic Resilience Buffer

Planned. Scrutinized. Strategic.

Category	Rationale	Allocation
Scope Creep & Feature Drift	Allows us to respond to critical partner feedback without breaking plan	$85,000
Hiring Friction & Lags	Flexibility for slower-than-expected recruitment or short-term specialist needs	$70,000
Infra Cost Spikes	Cloud compute bursts, storage overflow, or architectural pivots	$70,000
Data Licensing Overruns	Headroom for evaluating proprietary datasets (e.g., YES/IIR outages)	$65,000
Tooling, LLMs, Stack Snafus	Unforeseen software/tool subscriptions, dev environments, OS friction	$40,000

Total: $330K

Total Ask: $2.0M

→ Funding focused on durable infrastructure, tight feedback loops, and launch-readiness

→ Every dollar earns its place — and its role in compounding future value

We’re not guessing at costs — we’re modeling for resilience.
This budget is built on hard-won experience — with edge, endurance, and control.

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Appendix G:

Core Stack: Languages, Infrastructure & Deployment

Modular.
High-Performance.
Built to Last.

Core Stack

Built for performance, reproducibility, and modular growth

- **Languages:**
  - C++ → Simulation engine
  - Python → Modeling, orchestration, diagnostics
- **Storage:**
  - AWS RDS (MySQL) for structured data
  - AWS S3 for simulation output, model artifacts
- **Version Control:**
  - Git (Bitbucket or GitHub) + CI/CD integration
- **Deployment:**
  - Containerized workloads via Docker + ECS/Fargate
  - Slack/Email alert pipelines for diagnostics & outputs

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Appendix H:

Simulation Engine: Forecast, Replay, Act

Modular.
High-Performance.
Built to Last.

> *Custom-built for forward-worlds and trade strategy testing*

- Market regime simulator (multi-hub)
- Historical-forward replay of ISO nodal behavior
- Strategy tester: supports different risk/position frameworks
- Output: trade **P&L distributions**, **ruin probabilities**, **edge diagnostics**

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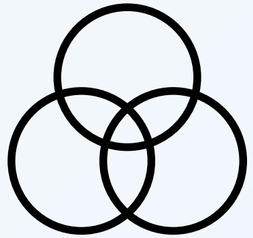
Appendix I:

Flip-Over Signal System: Models, Inference, Flow



Modular. High-Performance. Built to Last.

- **Input sources:**
  - ISO data (DART, outages), NOAA forecasts, congestion proxies
- **Model types:**
  - Regime detection (e.g., clustering)
  - Flip-over classifiers (custom supervised models)
  - Meta-model diagnostics (signal half-life/decay, flip precision)
- **Batch inference:**
  - Jobs run via EC2 with logging + diagnostic outputs auto-generated

> *This isn't throwaway code. It's an engineering scaffold for long-run edge.*

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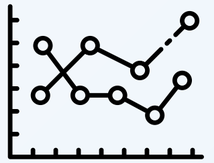
Appendix J. Historical–Forward Simulation Results (Preliminary)

(Shows legacy output from core simulation engine — spanning key MISO hubs)



Historic inputs.
Future logic.
Market terrain.

Portfolio Heat, %	Exp. Annlzd Rtrn, %	Ruin Probab, %	Max Drawdown, %	Ruin Threshold, %
0.1%	2%	0.00%	98%	75%
2.50%	48%	0.07%	55%	75%
5.00%	126%	0.25%	58%	75%
7.50%	247%	0.57%	54%	75%
10.00%	517%	1.13%	45%	75%

- **Assumptions & Outcome:**
  - MISO’s MN / MI / IN / IL hubs, 24/7 from Jan 2007–Jul 2017
  - Equal risk per hub; no transaction costs; flip-over effect unknown
  - Simulations guided the 7.5% portfolio heat I used over 6.5 real-money years

→ **Kept me in the game through risk, noise, and drawdowns**

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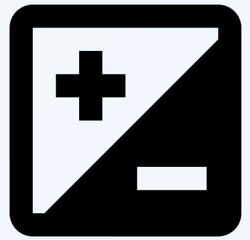
Appendix K: Flip-Over Conceptual Depth



Macro-Aware.
Signal-Literate.
Built for Shift.

- **Conceptual Framing**
  - The flip-over effect is **not a price spike, not a volatility burst**, and **not noise**.
  - It is a **macro regime switch** – a fundamental reordering of incentives and flows in the market's structure.
- **Why Naive Models Fail**
  - Traditional forecast models work on a micro level — hub-by-hub, hour-by-hour — and **miss the system-wide inflection.**
  - Most ML/quant approaches treat flip-overs as **statistical noise or outliers**, not as the **main event.**
- **Our Approach (Taste Only)**
  - We model **regime asymmetry**, not just directional price paths.
  - Signals are drawn from **cross-asset imbalances**, **load/generation edge conditions**, and **congestion stress proxies**.
  - **Objective:** *Early warning*, not post-mortem.
- **Moat = Conceptual Insight + Real Data**
  - Flip-over recognition is **not commoditized — yet**.
  - Our edge: **field insight**, **simulation traction**, and **engineered data views** that sharpen signal amid structural noise.

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Appendix L. Go-to-Market Monetization Sketch

Test. Deliver. Scale.

Core Idea

Pricing models will be tailored to customer type, engagement depth, and deployment pathway — balancing accessibility for early partners with scalability for future growth.

Pricing Models Under Exploration

Model	Description	Target Use Case
Seat-Based SaaS	Monthly subscription per analyst/trader user	Smaller desks, early design partners
Usage-Based (per MWh)	Scales with trading volume or portfolio exposure	Mid-size players, usage-based budgets
Flat Fee + Upside Share	Base access fee plus % of P&L upside if above threshold	Performance-driven shops seeking shared-risk
Enterprise License	All-you-can-use internal license for one desk/team	Large players, integrators, internal tooling
Platform Embed	Whitelabel or API access licensed to platform providers	OEMs, third-party data vendors, energy SaaS

Strategic Framing

1. **Focus first on product fit — not profit.**
   We'll price early versions to get smart customers using the system and sharing feedback. That learning loop matters more than margin right now.
2. **Where customers get fast, valuable insights — pricing becomes a non-issue.**
   We'll test how quickly clients see benefits. If the signal is sharp and useful, they'll pay for it — and gladly.
3. **Pricing will grow as the product matures and becomes sticky.**
   As we deepen our capabilities and become part of clients' workflow, we'll evolve the pricing to reflect the value and switching costs.

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Appendix M: Founder’s Philosophy: High-Leverage, Low-Fragility

Design. Stress. Endure.

I believe in building systems — not heroics.

VPDaaS is architected around clarity, repeatability, and focus.

- *The founder’s role is not to patch leaks — but to design systems that don’t leak.*
- I play “slack”: a utility player bridging quants, partners, and product.
- The org is modular: quants do quant; everything else is outsourced.
- We prioritize antifragility: no key-person traps, no single points of failure.
- Our tech stack reflects this — clean abstractions, shared principles, and reproducibility.

This isn’t a lifestyle business.

It’s a lean, durable, deep-tech platform for scalable trading intelligence.

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Appendix N — TAM Justification: Source-Backed Counts

Evidence. Method. Confidence.

https://www.eia.gov/electricity/data/eia923/--Form EIA-923 detailed data with previous form data (EIA-906/920)

https://www.ibisworld.com/united-states/number-of-businesses/utilities/147/--Utilities in the US - Number of Businesses (2005–2031)

https://www.eia.gov/electricity/data.php--Electricity

https://www.brattle.com/wp-content/uploads/2025/02/Electric-Utility-Municipalization-Key-Statistics-and-Risk-Considerations.pdf--Electric Utility Municipalization

KEY STATISTICS AND RISK CONSIDERATIONS

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