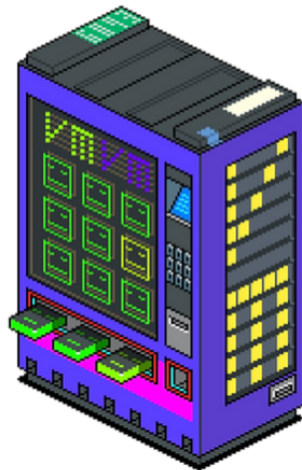


Everclear Simulation Report



VENDING MACHINE

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Abstract This simulation report evaluates the economic performance of a proposed vote-bonding token system, focusing on rewards for solvers and vbNEXT holders who engage with the Everclear clearing layer. Using a digital twin of the token model, the system’s evolution is analyzed under various scenarios, incorporating economic assumptions of Everclear and those derived from historical data of similar token designs and technical research. The analysis covers key parameters such as annual NEXT emission rates, decay rates, and revenue share percentages for vbNEXT, and assesses their impact on stakeholder rewards and system sustainability. Findings suggest that a 5% annual emission rate strikes a balance between incentivising early solvers and meeting performance benchmarks, while higher emission rates could lead to over-incentivisation and unsustainable long-term growth. A constraint of 10% allocation of total supply for incentives was considered and simulation results indicate sufficiency of economic incentives only in the short term under this constraint. Additionally, vbNEXT revenue share is analyzed, with a recommendation for 100%. The simulations indicate that alternative methods to reduce solver costs or increase NEXT token utility will be necessary to sustain the system at higher intent volumes, particularly when the Everclear reward constraints are applied. Key metrics, such as solver rewards and vbNEXT APR are monitored to ensure the protocol remains robust across a range of market conditions.

1 Introduction

Vending has been partnered with Everclear to develop a comprehensive token system for the upcoming launch of the Everclear protocol, as well as to provide economic simulations to parameterise the system. As part of this effort, the vote-bonding token (vbNEXT) system was proposed to incentivise solvers who net their intent volume on Everclear, while rewarding vbNEXT holders who participate in the gauge model to direct incentives and earn a share of protocol revenue.

To rigorously assess the economic viability of this token system, a detailed simulation study was conducted using a digital twin model that replicates the economic assumptions of the Everclear clearing layer. This model allowed for the evaluation of system performance over time under varying market conditions and intent volumes.

The simulation study simulated over 48 million possible states across a wide range of scenarios, providing a comprehensive analysis under various market conditions for the token system. The study focused on key factors such as emission rates, vbNEXT revenue shares, and solver incentives to determine how well the system could meet performance benchmarks.

Preliminary technical research was undertaken to establish reliable estimates for model assumptions, using historical data from comparable token systems. The simulation aimed to evaluate the impact of different emission rates—ranging from conservative (2.9%) to aggressive (11.8%) on the sustainability of rewards for both solvers and vbNEXT holders.

In addition to assessing the system’s core performance, the study included sensitivity analyses to explore how changes in key environmental variables, such as intent volume distribution across major traffic and long-tail chains, or shifts in locking rates, affect outcomes. This analysis provided insights into the resilience of the token system under varying external conditions and highlighted areas of potential vulnerability.

Stress testing was also conducted to simulate a combination of extreme market scenarios, such as significant price declines and reduced intent volumes, offering a view into how the system might perform under extremely adverse conditions.

The report also provides additional insights for key stakeholders, such as early partners and vbNEXT holders, as well as the potential for wash trading in the early stages of the protocol. These findings offer a nuanced understanding of the token system’s dynamics.

This simulation study provides a rigorous, data-driven foundation for Everclear’s strategic decisions regarding the implementation of the vbNEXT token system. By evaluating a broad range of possible outcomes and stress-testing the system under various conditions, this report ensures that the token system is designed for both initial success and sustainable operation in a rapidly evolving market environment.

2 Recommendations and Key Findings

2.1 NEXT Annual Emission and Emission Decay Rate

2.1.1 Recommendation 1 - Optimizing Solver Rewards given no Supply Constraint for Incentives

- 5% annual emission rate (distributed uniformly per epoch) is recommended.
 - Simulation results show high levels of incentives at the short-term target of \$1B monthly intent volume, as well as sufficient incentives at the medium-term target of \$4B monthly intent volume for solvers.
 - Provides a high level of solver rewards in the short term to attract intent volume to bootstrap initial growth.
- For a 5% starting emission rate, an annual 10% decay rate is recommended.
 - Total allocation of supply to fund emissions for 4 years comes to 17.195%; thereafter, token inflation can be used to fund the ongoing emissions if desired.
- This is an ideal level of system incentives to achieve short and medium term volume goals.

2.1.2 Recommendation 2 - Optimizing Solver Rewards given the 10% Supply Constraint for Incentives

- This recommendation considers the current supply allocation available for the gauge system, where a maximum of 10% of the NEXT token supply is allocated for incentives over a 4-year period.
- 2.9% annual emission rate is recommended under this constraint.
 - Solver rewards in bps are sufficient under the initial intent volume target, although at a reduced level to bootstrap initial incentive volume.
 - Possibility of providing sufficient incentives for solvers is considerably reduced when actual intent volume exceeds the medium-term target of \$4B monthly.
- For a 2.9% starting emission rate, an annual 10% decay rate is also recommended.
 - Total allocation of supply to fund emissions for 4 years comes to 9.97% and thereafter, token inflation can be used to fund the ongoing emissions if desired.
- Whilst this recommendation meets the current supply allocation constraint, the risk is that the system does not adequately incentivise solvers and therefore reduces the chance to reach the medium and long-term intent volume targets.

2.2 vbNEXT Revenue Share

- At initial intent volume levels, it is advisable to keep the revenue share percentage to vbNEXT holders at 100% to offer maximum vbNEXT APR from revenue share.
- The main trade-off of decreasing intent volume revenue share portion to vbNEXT to fund the DAO treasury reserve is the reduction in vbNEXT APR, which will be one of the primary incentives for any party to lock their NEXT tokens.

- Therefore, it should be done with caution, giving sufficient regard to the resulting levels of estimated vbNEXT revenue share APR and ensuring it is sufficient to make locking NEXT tokens an attractive action.
- As the Everclear system matures, this revenue share split can be revised to determine a portion of the revenue share that should be allocated towards the DAO treasury.

2.3 Inflation of NEXT Token Supply

- After 4 years, when the allocation of existing supply will have been depleted.
- If Everclear plans to implement the gauge system for more than 4 years, it is advisable to launch the system with inflation, so that emissions can be fulfilled with new supply and current treasury supply can be used for other growth initiatives.

2.4 Other Key Findings

- Early partners will be whitelisted solvers, and therefore their rewards are likely to be higher than estimated in the modelling, as the same rewards will be distributed over a smaller pool of intent volume.
- Wash trading intent volume is expected at the initial stages after launch when solver NEXT rewards in bps exceed average solver costs.
 - The severity of wash trading will depend on how much wash traders will be able to re-balance their own intent volume. It is improbable that this will hold true in practice, and the presence of wash trading volume may increase the organic netting percentage on Everclear.

3 Model Configuration

3.1 Model Assumptions

3.1.1 System assumptions

Table 1: Epoch Length Parameter and Rationale

Parameter	Value	Rationale
Epoch length (in days)	14	Governance epoch from Everclear’s team feedback

3.1.2 NEXT assumptions

Table 2: NEXT Token Parameters

Parameter	Value
NEXT initial price	\$0.1395
NEXT total supply	1,000,000,000
NEXT initial circulating supply	90,000,000
NEXT supply schedule	Time-series of NEXT unlock schedule

3.1.3 vbNEXT assumptions

Technical research was conducted into historical data of similar token designs to obtain the following estimates for parameters relating to locking and early exit behaviour applied to the NEXT token system.

Table 3: vbNEXT Parameters and Rationale

Parameter	Value	Rationale
vbNEXT early unlock rate (daily)	0.0426%	Data obtained through research across different protocols (Yearn Finance and Radiant)
vbNEXT early exit tax rate	27.31%	Based on initial estimates of minimum and maximum exit tax rates (20% and 80%, respectively), as well as the NEXT to vbNEXT conversion rate and technical research into historical early exit data
NEXT to vbNEXT conversion rate	0.8808	Data obtained through research on locking duration distribution across different protocols (Curve and Balancer)

3.1.4 Pricing assumptions

The following pricing assumptions were obtained from Everclear team’s research into pricing dynamics for both major traffic and long-tail chains, where aggregate values were extracted and used in the model.

Table 4: Pricing Assumptions

Parameter	Value
Major traffic chain network fee per intent volume	0.7 bps
Major traffic chain DAO fee per intent volume	0.3 bps
Major traffic chain arbitrageur discount per intent volume	1.0706 bps
Long-tail chain network fee per intent volume	1 bps
Long-tail chain DAO fee per intent volume	1 bps
Long-tail chain arbitrageur discount per intent volume	7.215 bps

3.2 Parameters to Set

3.2.1 NEXT Emission Rate Per Year

Annual emission of NEXT tokens will be distributed uniformly across the year for each epoch, directed to spoke contracts as solver incentives.

3.2.2 Annual NEXT Emission Decay Rate

This will be applied yearly to reduce the NEXT emission rate for the following year. The decay rate is proposed to reduce the pressure on the protocol to emit incentives to its stakeholders over time, after achieving sufficient scale and growth in the initial phase. Furthermore, should the system need to inflate the total supply to fund ongoing emissions to solvers, an annual decay rate in emissions will reduce the inflationary pressure on the NEXT token supply.

3.2.3 vbNEXT Revenue Share Percentage

The split of protocol fees collected on intent volume, which will be directed to vbNEXT token holders as economic incentives.

3.3 Environmental Variables

3.3.1 NEXT Price

Geometric Brownian Motion (GBM) was used to simulate the stochastic trend of NEXT price for each simulation run.

Drift and diffusion parameters were obtained by retrofitting the GBM distribution to the historical NEXT price as well as CRV token price 1 year after its launch.

Our study substituted the standard *Wiener process* in the GBM for randomness at each time point with a *Student's t-distribution* with 8 degrees of freedom to allow for a greater incidence of extreme values i.e. fatter tails of the bell curve.

Price scenarios tested:

Table 5: Price Scenarios and Descriptions

	Price Scenario Description
1	Increasing price trend based on CRV token price trend in the first year after launch
2	Decreasing price trend based on CRV token price trend in the first year after launch
3	Increasing price trend based on half of CRV token price trend in the first year after launch
4	Decreasing price trend based on half of CRV token price trend in the first year after launch
5	Zero price drift with high volatility
6	Rapid price decrease for the first 2 months, followed by a steady increase for the remaining period
7	Rapid price increase for the first 2 months, followed by a very small increase for the remaining period
8	Rapid price increase for the first 2 months, followed by a steady decrease for the remaining period

3.3.2 Intent Volume

4 different levels of intent volume scenarios were tested across all price scenarios to understand the performance of the system under different adoption levels of Everclear.

Table 6: Monthly Intent Volume and Descriptions

	Monthly Intent Volume	Description
1	\$500M	A pessimistic scenario where only 50% of the best-estimate monthly intent volume
2	\$1B	Best estimate target volume for Everclear at launch, used as the medium case in simulations (1-month internal target)
3	\$5B	Optimistic scenario, halfway between best-estimate and mature-state intent volume targets (4-month internal target: \$4B)
4	\$10B	Target intent volume per month in the mature state of the protocol (12-month internal target)

3.3.3 Locking Rates

Locking behaviour of NEXT token was obtained via technical research into historical data for comparable token locking designs such as Curve, Balancer and Camelot.

To remove noise from the gathered data, daily net locking rates were calculated by averaging the locking rates from 3 different historical datasets.

All scenarios in the initial simulation runs used average locking rates without adjustment and sensitivity of the metrics to the changes in locking rates is highlighted under Sensitivity Analysis.

3.4 Simulation Configuration

This simulation study employs Monte Carlo simulations to simulate potential future scenarios given a configuration of a stochastic nature. Therefore, each simulation run result is different from the next.

The results from each simulation are aggregated and metrics are computed on the aggregate results, which are then compared to the benchmarks.

Table 7: Simulation Parameters

Number of runs per scenario	10,000
Number of timesteps (epochs)	48

10,000 simulations were chosen as the distribution of randomly generated numbers according to a Student’s t-distribution with 8 degrees of freedom fit the assumed distribution satisfactorily, with Mean Squared Error (MSE) of 3.94e-06.

48 timesteps were determined given an epoch length of 2 weeks and a total simulation duration of 24 months.

3.5 Metrics

Below we highlight the metrics that were computed for each simulation run, which signalled the strength of economic incentives for solvers and vbNEXT holders.

All of the metrics will be calculated for each simulation run and then averaged for different time periods to represent the mean figure.

3.5.1 Solver Reward in bps Per Epoch

Solver metrics were calculated in bps per epoch to align with the costing assumptions for solver activity, thus aligning with the conventional way of comprehending solver economics.

$$R_t^S = \frac{\text{NEXT emissions} \times \text{NEXT price in epoch } t}{\text{solver intent volume in epoch } t}$$

3.5.2 Solver Net Cost in bps Per Epoch

$$C_t^S = \frac{\text{network cost} + \text{protocol cost} + \text{arbitrageur discount}}{\text{solver intent volume}}$$

$$NC_t^S = C_t^S - R_t^S$$

3.5.3 Additional Intent Volume (%) as Profitable Wash Trading

$$PWT_t = \frac{R_t^S}{C_t^S} - 1$$

This metric relies on the assumption that wash traders are able to settle 100% of their own intent flow and receive an average allocation of NEXT emissions from the spoke contracts for the chain on which they have been active.

3.5.4 vbNEXT Revenue Share APR

$$r_t^{VB} = \frac{\text{revenue share of protocol fee in epoch } t}{\text{vbNEXT supply} \times \text{NEXT price}} \times \frac{365}{\text{epoch length in days}}$$

3.5.5 vbNEXT Early Exit Tax Redistribution APR

$$p_t^{VB} = \frac{\text{tax applied on early exits}}{\text{remaining vbNEXT supply}} \times \frac{365}{\text{epoch length in days}}$$

3.5.6 vbNEXT Total APR

$$R_t^{VB} = r_t^{VB} + p_t^{VB}$$

3.6 Benchmarks

3.6.1 Solver Reward in bps Per Epoch

Strict requirement

Solver reward in bps \geq average discount cost for solvers in bps.

- NEXT token rewards subsidise the cost of discounts given to arbitrageurs to effectively make the system achieve equivalent price savings as if 100% organic netting occurred.

Weak requirement

Solver reward in bps \geq solver cost in bps \rightarrow solver net cost in bps ≤ 0 .

- Solvers are not incurring a cost for netting on Everclear.
- This will increase the attractiveness for solvers to be netted using the Everclear network, attracting more solver intent volume, and igniting the flywheel over time by:
 - Improving the efficiency of Everclear’s clearing layer.
 - Potentially reducing the fixed costs incurred by solvers.

The table below summarises the benchmarks for solver reward in bps by split of intent volume between major traffic vs long-tail chains.

Table 8: Major Traffic and Long-tail Chain Splits

	85:15 split	70:30 split
Strict requirement	1.99 bps	2.91 bps
Weak requirement	3.14 bps	4.21 bps

Wash trading will be profitable if the weak benchmark is met and unprofitable if solver rewards are below the weak benchmark.

3.6.2 vbNEXT Total APR

No benchmark has been set for this APR, as the primary objective of the parameter setting is to determine the suitable NEXT emission rate for solvers.

vbNEXT APR will be determined primarily by the experience of monthly intent volume on the Everclear clearing layer, and thus the total fees accrued for revenue share.

3.6.3 Wash Trading

No benchmark was set for additional volume as profitable wash trading, given the rewards and costs for solvers in bps per epoch.

The primary reason for not setting a benchmark for this metric is that, unlike other DeFi protocols where wash trading to farm rewards is a net-negative behaviour for the protocol and its users, wash trading on Everclear could contribute to more efficient netting and long-term cost reduction, benefiting the users of Everclear.

4 Simulation Results

4.1 Summary by Parameter to be Optimised

4.1.1 Summary of NEXT Emission Rate

Based on the simulation result findings, the performance of each emission rate has been rated on a scale of 0 - 5 for each of the key considerations.

Table 9: Emission Rate Benchmarks and Descriptions

Initial emission rate	Benchmarks on short-term target intent volume (\$1B) (0-5)	Benchmarks on med-term target intent volume (\$5B) (0-5)	Benchmarks on mature state target intent volume (\$10B) (0-5)	Sustainability of emission from allocated supply (0-5)	Over-incentivisation of solvers & wash trading profitability (0-5)	Short term reward metrics for early partners (0-5)
2.9%	5: Strict and Weak benchmarks satisfied under high and medium likelihood scenarios	1: Weak benchmark satisfied only under one high likelihood scenario	0: Neither strict nor weak benchmarks met under any scenarios	5: 10% of total allocation used for emissions in 4 years	5: High volume of wash trading can be suspected at low intent volume levels, but expected to disappear as real intent volume grows.	3: 3.42 - 6.09 bps at \$1B monthly intent volume, 1.14 - 1.54 bps at \$5B monthly intent volume
5%	5: Strict and Weak benchmarks satisfied under high and medium likelihood scenarios	3: Weak benchmarks satisfied under high and medium likelihood scenarios	1: Weak benchmark satisfied only under one high likelihood scenario	2: 17.20% of total allocation used for emissions in 4 years	2: Wash trading still profitable until medium term target intent volume is reached	4: 7.06 - 12.57 bps at \$1B monthly intent volume, 2.36 - 3.19 bps at \$5B monthly intent volume

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Table 9: Emission Rate Benchmarks and Descriptions (Continued)

11.8%	5: Strict and Weak benchmarks satisfied under high and medium likelihood scenarios	5: Strict and Weak benchmarks satisfied under high and medium likelihood scenarios	4: Weak benchmarks satisfied under high and medium likelihood scenarios	0: can fund 1.8 years worth of emissions using initial allocation of 21%	0: Wash trading will be very profitable as solver rewards are significantly higher at all intent volume levels	5: 15.62 - 27.72 bps at \$1B monthly intent volume, 5.54 - 7.49 bps at \$5B monthly intent volume
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4.1.2 Summary of vbNEXT Revenue Share Percentage

Based on the simulation result findings, the performance of each revenue share percentage has been rated on a scale of 0 - 5 for each of the key considerations.

Table 10: vbNEXT Revenue Share and DAO Treasury Reserve Projections

Revenue share percentage	vbNEXT revenue share APR (0-5)	Projected DAO treasury reserve (0-5)
50%	2: 4.18 - 8.91 at high likelihood price scenarios and initial target intent volume; 5: 16.84 - 22.06 at medium-term target volume	5: \$256,430 after 1 year at initial target intent volume, \$1,282,151 after 1 year at medium-term target, \$2,564,302 at mature state target intent volume
80%	4: 6.7 - 14.26 at high likelihood price scenarios and initial target intent volume; 5: 26.95 - 35.34 at medium-term target volume	2: \$102,572 after 1 year at initial target intent volume, \$512,860 after 1 year at medium-term target, \$1,025,721 at mature state target intent volume
100%	5: 8.37 - 17.83 at high likelihood price scenarios and initial target intent volume; 5: 33.68 - 44.18 at medium-term target volume	0: \$0

4.2 NEXT Emission Rate

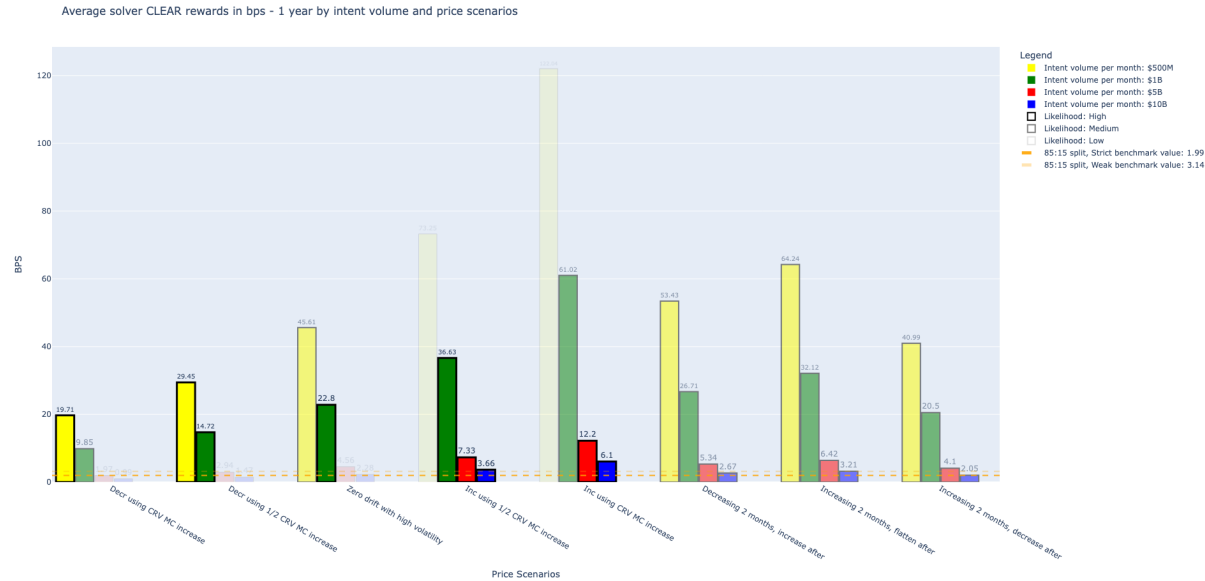
4.2.1 11.8% Emission Rate

The minimum level of NEXT emissions required to meet the benchmarks under all tested intent volume levels is 11.8%, but this is not a feasible or a sustainable recommendation.

This highlights that once the Everclear protocol reaches its mature state target intent volume of \$10B per month, NEXT emissions alone may not sufficiently incentivise solvers to net using the Everclear clearing layer.

Therefore, alternative methods to incentivise solver activity, such as reducing solver net cost or introducing additional NEXT token utility, will need to be explored.

Figure 1: Plots showing average solver NEXT rewards over 1 year at 11.8% emission rate



Analysis of 1 year metrics at 85:15 intent volume split between major traffic vs long-tail chains

Table 11: Benchmarks at 11.8% emission

Monthly intent volume	Strict Benchmark	Weak Benchmark
\$500M	Satisfied under all high and medium likelihood price scenarios.	Satisfied under all high and medium likelihood price scenarios.

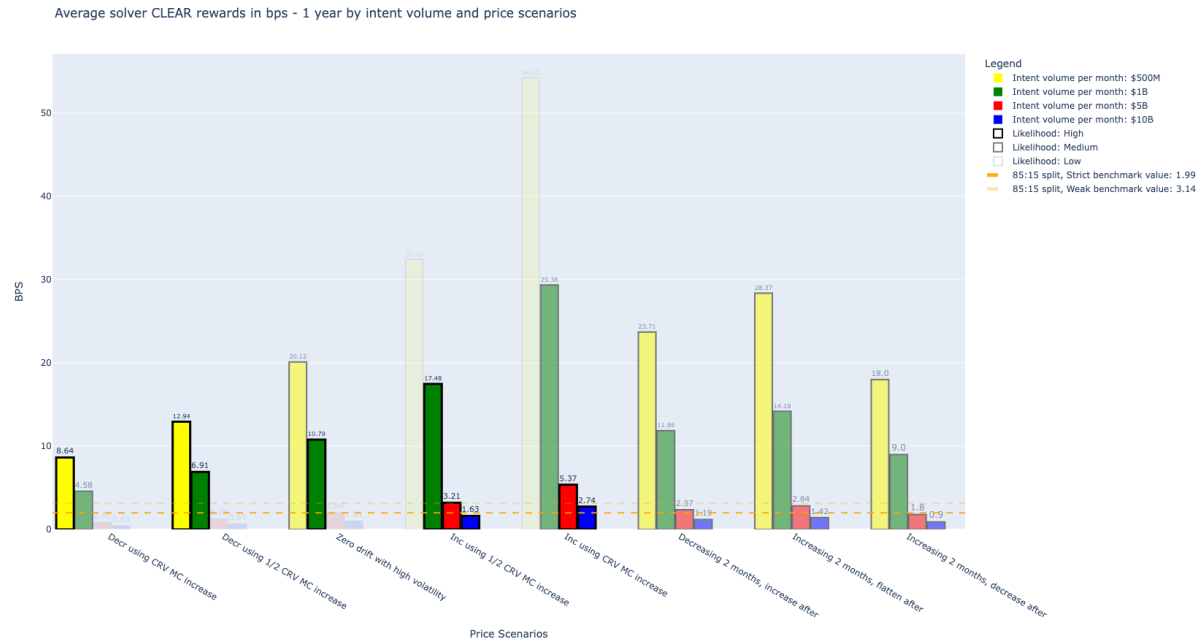
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Table 11: Benchmarks at 11.8% emission (Continued)

\$1B	Satisfied under all high and medium likelihood price scenarios.	Satisfied under all high and medium likelihood price scenarios.
\$5B	Satisfied under all high and medium likelihood price scenarios.	Satisfied under all high and medium likelihood price scenarios.
\$10B	Satisfied under all high likelihood price scenarios.	Satisfied under all high likelihood price scenarios.

4.2.2 5% Emission Rate

Figure 2: Plots showing average solver NEXT rewards over 1 year at 5% emission rate



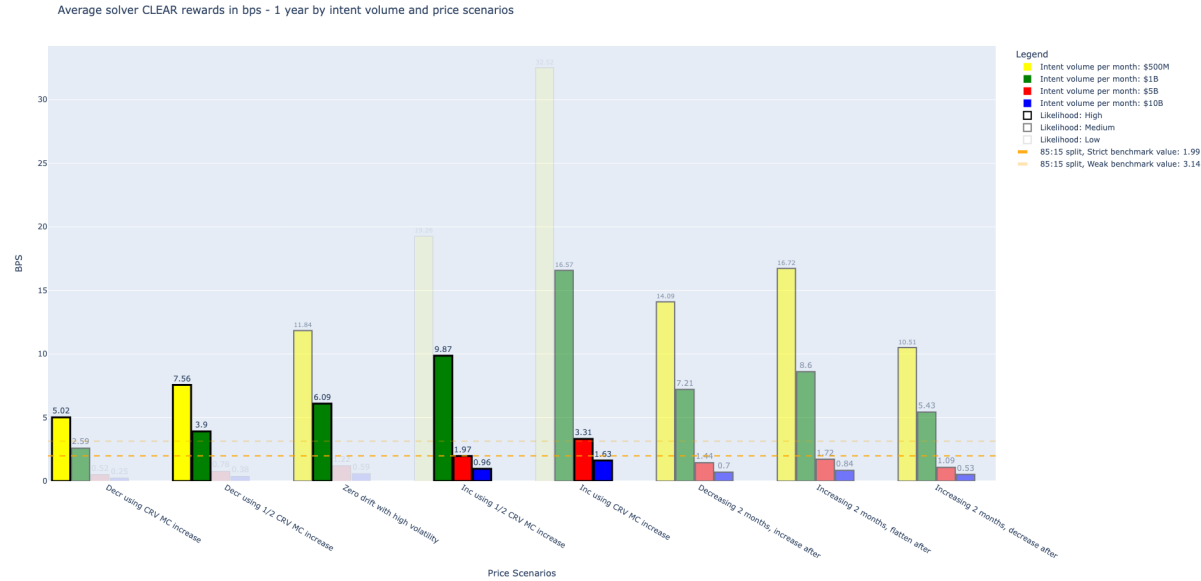
Analysis of 1 year metrics at 85:15 intent volume split between major traffic vs long-tail chains

Table 12: Benchmarks at 5% emission

Monthly intent volume	Strict Benchmark	Weak Benchmark
\$500M	Satisfied under all price scenarios.	Satisfied under all price scenarios.
\$1B	Satisfied under all price scenarios.	Satisfied under all price scenarios.
\$5B	Only satisfied under monotonically increasing price scenarios.	Only satisfied under strictly increasing price scenarios.
\$10B	Only satisfied under the highest price scenario.	Not met under any price scenario.

4.2.3 2.9% Emission Rate

Figure 3: Plots showing average solver NEXT rewards over 1 year at 2.9% emission rate



Analysis of 1 year metrics at 85:15 intent volume split between major traffic vs long-tail chains

Table 13: Benchmarks at 2.9% emission

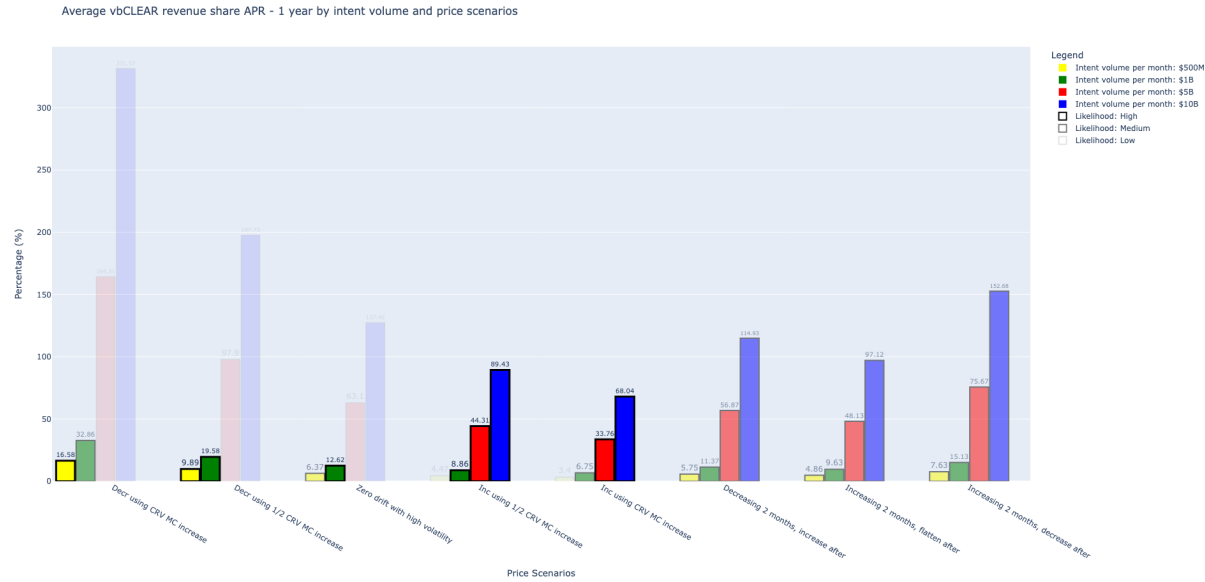
Monthly intent volume	Strict Benchmark	Weak Benchmark
\$500M	Satisfied under all price scenarios.	Satisfied under all price scenarios.
\$1B	Satisfied under all price scenarios.	Satisfied under the vast majority of price scenarios.
\$5B	Only satisfied under large increasing price scenario.	Not met under any price scenario.
\$10B	Not met under any price scenario.	Not met under any price scenario.

4.3 vbNEXT Revenue Share

Further experiments were conducted across various combinations of intent volume and price scenarios with different splits of revenue share between vbNEXT holders and the DAO treasury reserve. These experiments aimed to understand the impact on vbNEXT revenue share APR and to approximate the cumulative values of the DAO treasury reserve over time.

- 0% to DAO treasury reserve (100% to vbNEXT holders)

Figure 4: Plots showing average vbNEXT APR over 1 year at 100% revenue share at 2.9% emissions



- **20% to DAO treasury reserve (80% to vbNEXT holders)**
 This leads to a reduction in vbNEXT revenue share APR by 20% (relative).

Table 14: DAO Treasury Reserve Projections under 20% revenue share

DAO treasury reserve	\$500M monthly intent volume	\$1B monthly intent volume	\$5B monthly intent volume	\$10B monthly intent volume
6 months	\$29,455	\$58,911	\$294,555	\$589,109
12 months	\$51,286	\$102,572	\$512,860	\$1,025,721
24 months	\$110,746	\$221,493	\$1,107,464	\$2,214,929

- **50% to DAO treasury reserve (50% to vbNEXT holders)**
 This leads to a reduction in vbNEXT revenue share APR by 50% (relative).

Table 15: DAO Treasury Reserve Projections under 50% revenue share

DAO treasury reserve	\$500M monthly intent volume	\$1B monthly intent volume	\$5B monthly intent volume	\$10B monthly intent volume
6 months	\$73,639	\$147,277	\$736,386	\$1,472,773
12 months	\$128,215	\$256,430	\$1,282,151	\$2,564,302
24 months	\$276,866	\$553,732	\$2,768,661	\$5,537,322

5 Sensitivity Analysis

5.1 Split of Intent Volume to Major Traffic vs Long-tail Chains

After running the simulations for the scenarios above, we further studied the sensitivity of the solver economics to the split of intent volume across major traffic vs long-tail chains.

Given the aggregate costing assumptions for solvers, the average solver cost for re-balancing can be expressed via:

$$C_t^S = x \times TC^M + (1 - x) \times TC^{LT}$$

where:

- x = percentage of total intent volume from major traffic chain
- TC^M = total re-balancing cost on major traffic chain
- TC^{LT} = total re-balancing cost on long-tail chain

$$\implies C_t^S = 2.0706x + (1 - x) \times 9.215 = 9.215 - 7.1444x$$

Therefore, the total average cost per solver decreases by 0.71444 bps as intent volume from major traffic chains increases by 10% on average.

Given that the protocol fees is also lower for major traffic chains, vbNEXT APR via revenue share can also be expected to decrease should the intent volume from major traffic chains increases.

5.1.1 Simulation Results

The simulation tested intent volume splits of 85:15 and 70:30 between major traffic and long-tail chains, highlighting the impact on solver costs and vbNEXT APR:

- **85:15 Split:**
 - Cost per solver volume: 3.14 bps
 - Average protocol fee for revenue share: 0.405 bps
- **70:30 Split:**
 - Cost per solver volume: 4.21 bps
 - Average protocol fee for revenue share: 0.51 bps

The 85:15 split results in a 1.07 bps lower net cost for solvers, while vbNEXT APR is projected to be 25.93% (relative) lower in the 70:30 split.

5.2 Net Locking Rates of NEXT Tokens

An increase in the net locking rate of NEXT tokens is expected to have negative impact of the resulting vbNEXT APR, as the same rewards will be diluted over a greater base of vbNEXT supply.

5.2.1 Simulation Results

The simulation tested the same price and intent volume scenarios under different net locking rate conditions:

- Baseline net locking rate (average of Curve, Balancer, and Camelot).
- 10% increase in net locking rate from baseline.
- 20% increase in net locking rate from baseline.

10% Increase in Net Locking Rate from Baseline

- Resulted in an average 5.65% reduction in vbNEXT revenue share APR.

20% Increase in Net Locking Rate from Baseline

- Resulted in an average 14.90% reduction in vbNEXT revenue share APR.

From this analysis, it can be inferred that the vbNEXT revenue share APR is expected to decrease at a faster-than-1:1 rate as the locking rate of NEXT increases.

Additionally, the increase in vbNEXT early exit tax redistribution APR is proportional to the increase in the net locking rate.

6 Stress Testing

The goal of the stress testing is to observe system performance under a scenario where multiple environmental variables enter an extremely adverse state.

6.1 Scenario Setup

- Since the NEXT token system relies heavily on initial solver volume to ignite flywheel effects, this stress test simulates a scenario where only 10% of the initial intent volume target is achieved, leading to \$100M monthly intent volume.
- A sharp decline in the NEXT token price is simulated, with a 90% drop in the first month followed by a gradual decrease throughout the simulation period.
- Average solver costs in bps are expected to increase due to the higher proportion of intent volume from long-tail chains, with a 50:50 split between major traffic and long-tail chains assumed.
- The net locking rate assumptions for NEXT tokens were increased by 50%, diluting the revenue share and further reducing vbNEXT APRs.
- To simulate higher degrees of extreme price movements, the degrees of freedom in the Student's t-distribution feeding into the GBM of NEXT price were reduced from 8 to 6.
- An annual NEXT emission rate of 2.9% was used to amplify the impact of adverse market conditions.

Graphs depicting circulating supply of NEXT, vbNEXT supply and prices for the stress test scenario are included in Appendix E.

6.2 Results

6.2.1 Simulation Run Metrics for Stress Test Scenario

Table 16: Solver Metrics Over Time

	Solver CLEAR rewards (bps)	Solver net cost (bps)	vbCLEAR rev share APR	Profitable wash trade volume (%)
6 months	4.23	1.41	14.72	17.64
12 months	3.40	2.24	36.47	15.26
24 months	2.03	3.61	423.72	8.50

6.2.2 Key Takeaways

- Strict and weak benchmarks for solver NEXT rewards in bps are met in the first 6 months, but performance of incentives degrades over time under adverse market conditions, falling short of the benchmarks in the 2-year period.
- However, solver NEXT rewards are still expected to offset a considerable portion of solver costs.

- Some level of wash trading can still be expected under this stress scenario, as solver rewards will exceed solver net costs.
- vbNEXT revenue share will be relatively strong due to the downward trajectory of the NEXT price, which offsets the revenue share collected from low incentive volumes.
- Given the downward trajectory of NEXT price, vbNEXT APR over 2 years becomes extremely large, potentially providing price support for NEXT as economic incentives to buy and lock NEXT tokens for revenue share remain high.

7 Other Insights

7.1 Incentives for Early Partners

- Early partners will be whitelisted solvers, and therefore their rewards are likely to be higher than estimated in the modelling, as the same rewards will be distributed over a smaller pool of intent volume.
- NEXT tokens should be distributed retroactively or regularly to early partners in proportion to the chosen annual emission rate, to achieve the results indicated by the modelling.
- **85:15 intent volume split between major traffic vs long-tail chains.**

Below is the table outlining the range of average solver rewards in bps in the first 6 months of protocol launch under each intent volume scenario and the most probable price scenarios.

Table 17: Range for solver rewards in bps in first 6 months

Monthly intent volume	2.90% emission rate	5% emission rate	11.80% emission rate
\$500M	5.9 - 7.74	10.36 - 13.58	23.83 - 31.23
\$1B	3.98 - 7.08	7.06 - 12.57	15.62 - 27.72
\$5B	1.42 - 1.92	2.36 - 3.19	5.54 - 7.49
\$10B	0.69 - 0.93	1.2 - 1.62	2.77 - 3.75

7.2 vbNEXT Total APR

- NEXT lockers will not earn the modelled revenue share APR until the gauge system is live and revenue share begins to flow to vbNEXT holders.
- The average vbNEXT APR estimate is significantly high during early periods after launch due to the relatively low base value of vbNEXT holdings compared to the revenue share collected from intent volume.
- Over time, vbNEXT APR averages out as the base value of vbNEXT holdings increases.
- The APR a NEXT token holder can receive from vbNEXT will depend on the duration that the NEXT token is locked. At maximum lock duration, 100% of vbNEXT APR will be attainable by the NEXT token holder.

7.3 Early Exit Tax

Given the formula for the expected APR from early exits, given an average tax rate applied on early exits, the calculation of APR can be approximated:

$$p_t^{VB} = \frac{\text{tax applied on early exits}}{\text{remaining vbNEXT supply}} \times \frac{365}{\text{epoch length in days}}$$
$$\implies p_t^{VB} = \frac{\text{average tax rate} \times \text{early exits}}{\text{remaining vbNEXT supply}} \times \frac{365}{\text{epoch length in days}}$$

$$\Rightarrow p_t^{VB} = \frac{\text{average tax rate} \times \text{early exit rate} \times \text{vbNEXT supply}}{(1 - \text{early exit rate}) \times \text{vbNEXT supply}} \times \frac{365}{\text{epoch length in days}}$$

$$\Rightarrow p_t^{VB} \approx \frac{\text{average tax rate} \times \text{early exit rate}}{(1 - \text{early exit rate})} \times \frac{365}{\text{epoch length in days}}$$

- The observed average tax rate on early exits was 27.31%, based on technical research.
- Given the average locking duration as a percentage of the maximum lock, the average APR for remaining vbNEXT holders is around 4.27%.

7.4 Wash Trading

- A healthy system benefits from higher intent volumes and moderate price scenarios (both increasing and decreasing).
- Unlike wash trading activity on trading or lending protocols, the presence of wash trading on Everclear is not purely net-negative, as it is not guaranteed that wash traders will be able to net out their own intent flow, making reward capture uncertain.
- The presence of wash trading on Everclear may increase the percentage of natural netting, thereby improving the experience for other solvers and reducing costs.
- Wash trading profitability is likely to exist during the initial period after protocol launch until actual monthly intent volume becomes large enough to make NEXT rewards lower than the total costs incurred by solvers.
- Fully mitigating wash trading profitability during the initial phases comes with a significant opportunity cost, as it would reduce the high levels of initial incentives intended to attract solvers.
- A peak of around 20% average profitable wash trading occurs during the most intense increasing price scenario with the lowest intent volume. The lowest levels of wash trading are expected at medium-term and mature-state intent volumes.

7.5 NEXT Price

- The trajectory of NEXT price will likely be driven by the APR that vbNEXT token holders expect to earn from revenue share.
- If growth in intent volume on Everclear exceeds expected levels, NEXT price could increase, as demand for NEXT tokens rises.
- The NEXT token price will also be subject to overall market sentiment in the cryptocurrency industry, and it may follow general short-term price trends in the market.

8 Conclusion

8.1 Key Takeaways

- A 5% annual emission rate is recommended as it balances early solver incentives with long-term sustainability. This rate satisfies the benchmarks in high and medium-likelihood scenarios, making it ideal for initial growth.
 - The protocol can provide sufficient economic incentives in the short and medium term, but at mature intent volume targets (\$10B per month), alternative strategies beyond emission-based rewards (such as further token utility or solver cost savings) will be necessary to maintain solver participation.
- The 2.9% emission rate minimizes incentives but risks reduced early volume growth and failing to meet benchmarks under higher volume scenarios, especially if the protocol grows faster than expected.
- Keeping vbNEXT revenue share at 100% initially maximizes early returns for vbNEXT holders, attracting NEXT holders to lock their tokens.
- Some degree of wash trading is expected during the initial phases when solver NEXT rewards exceed solver costs. However, incentivising wash trading should not be considered a sustainable long-term approach.
- Under adverse market conditions, such as low intent volume and sharp price declines, the economic incentives will remain robust in the short term but cannot be sustained beyond 1 year.

8.2 Potential Roadmap Items for Everclear

- **Monitor Solver NEXT Rewards:**
 - Continuously monitor both the average cost and rewards on Everclear to ensure that benchmark levels are met.
 - Additional refinement of benchmarks for solver rewards may be needed based on actual experience once Everclear is live.
- **Monitor Wash Trading Behaviour:**
 - Analyse the intent volumes netted out by solvers, focusing on similar sizes, flows, and timing.
 - Monitor the concentration of intent volume in spoke contracts where the majority of emissions are directed.
- **Monitor vbNEXT Revenue Share APR:**
 - As intent volume grows and the NEXT token supply schedule progresses, it will be imperative to monitor the levels of vbNEXT revenue share APR to determine the appropriate time to switch on revenue share to the DAO.
- **Investigate Cost-Saving Measures for Solvers at High Intent Volumes:**
 - As intent volume grows, finding cost-saving measures for solvers will be key to enhancing the economic incentive to use the Everclear clearing layer, particularly when emissions alone are no longer sufficient.
- **Ideate Further Incentives for Solvers:**

- At high levels of intent volume, pure NEXT token emissions may become insufficient. Therefore, exploring further economic incentives for solvers or additional token utility for NEXT tokens will be crucial.

9 Limitations

This section highlights the limitations of the model used for simulations and, by extension, the recommendations made.

- **Solver Cost Assumptions:**

- Aggregate costing assumptions for solvers on major traffic and long-tail chains were used, based on prior research by the Everclear team.
- The model does not explicitly account for organic netting and arbitrageurs' netting throughout epochs, and thus cannot be used to make specific recommendations regarding these dynamics.

- **Individual Spoke Contracts:**

- The model does not include specific spoke contracts, meaning solver NEXT rewards in bps from simulations represent an average across all solvers, regardless of their destination chains.

- **Interaction Between Protocol Metrics and NEXT Price:**

- Back-testing was performed under specific adverse scenarios (e.g., low intent volume and declining NEXT price), but the model does not outline the impact of protocol metrics on NEXT price or vice versa.

- **Second-Order Impacts of Circulating Supply of NEXT on NEXT Price:**

- The model does not define a relationship between the circulating supply of NEXT tokens and the token price. This omission was intentional to avoid incorporating spurious assumptions and to prevent over-fitting the model with predefined relationships.

- **Time Period Granularity:**

- Since the model measures time in epochs (14-day intervals), it is effective at predicting the macro functions of the system over time. However, it does not capture intra-epoch trends or micro-economic functions.

- **Scenarios Tested:**

- The figures and results demonstrated in this report are outputs from the underlying scenarios that were tested during the simulations. Should the actual market conditions differ from the scenarios that are tested, it is expected that the results will deviate from the results in this report.

- **Smart Contract Risk:**

- The model does not account for smart contract risk or any associated events. As a result, actual economic metrics could deviate from the simulated results if such risks materialise.

10 Disclaimer

This token design documentation is provided by Vending Machine, a token design firm, for informational purposes only. The information contained herein is based on a modified version of a modelling based systems engineering process and is intended solely for the use of Everclear. Vending Machine makes no representation or warranty, express or implied, for the information contained in this documentation.

The comments in this document are made in relation to the currently proposed system design by the core team. Therefore the information provided is only relevant given the current circumstances of the protocol and may become outdated.

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Appendices

A Differential Specification of Everclear Model used for Simulations

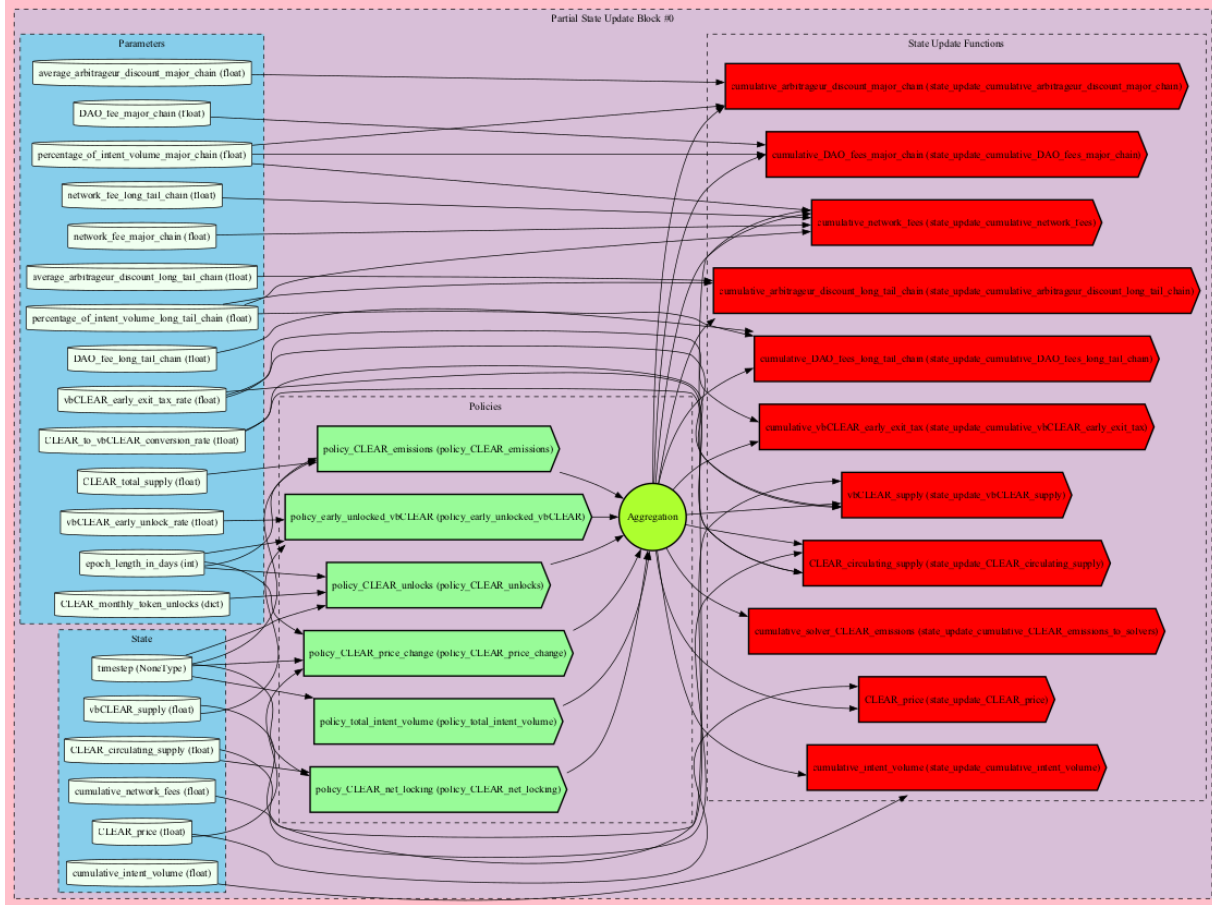


Figure 5: Differential Specification of Model used for Everclear Simulations

B Additional plots for Simulation Results using 2.9% emission rate

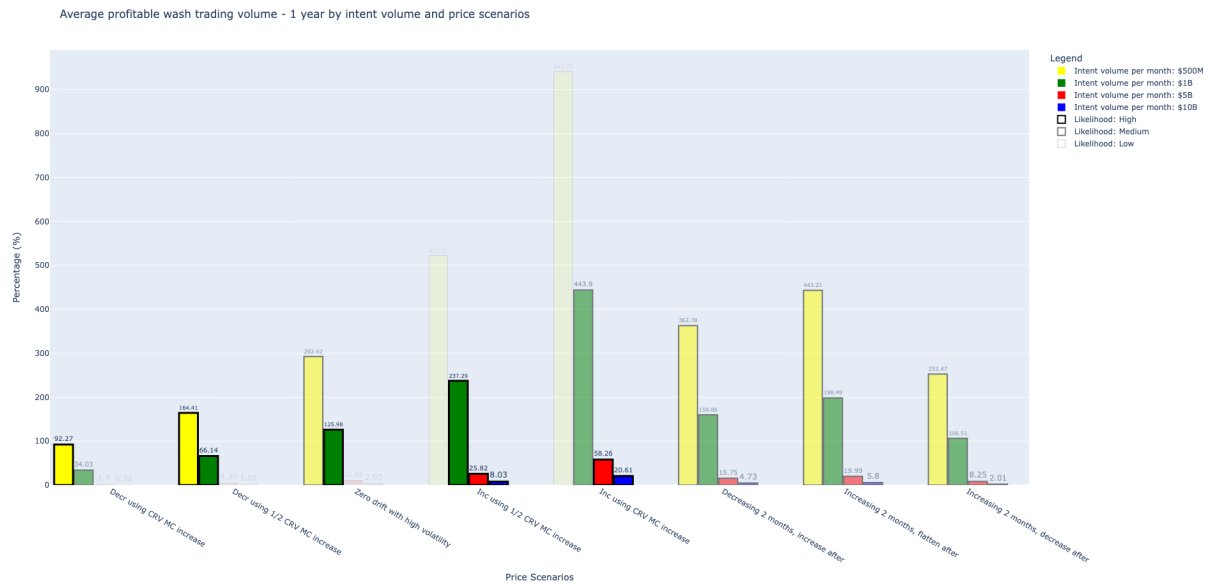


Figure 6: Average profitable wash trade volume over 1 year at 2.9% emission rate

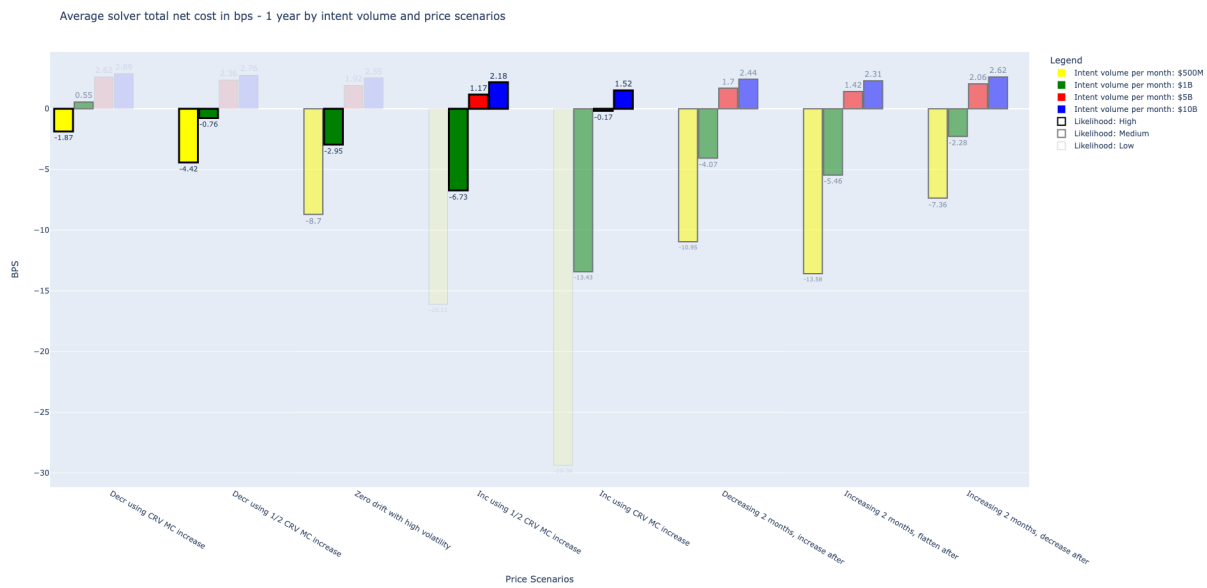


Figure 7: Average solver net cost in bps over 1 year at 2.9% emission rate

C Additional plots for Simulation Results using 5% emission rate

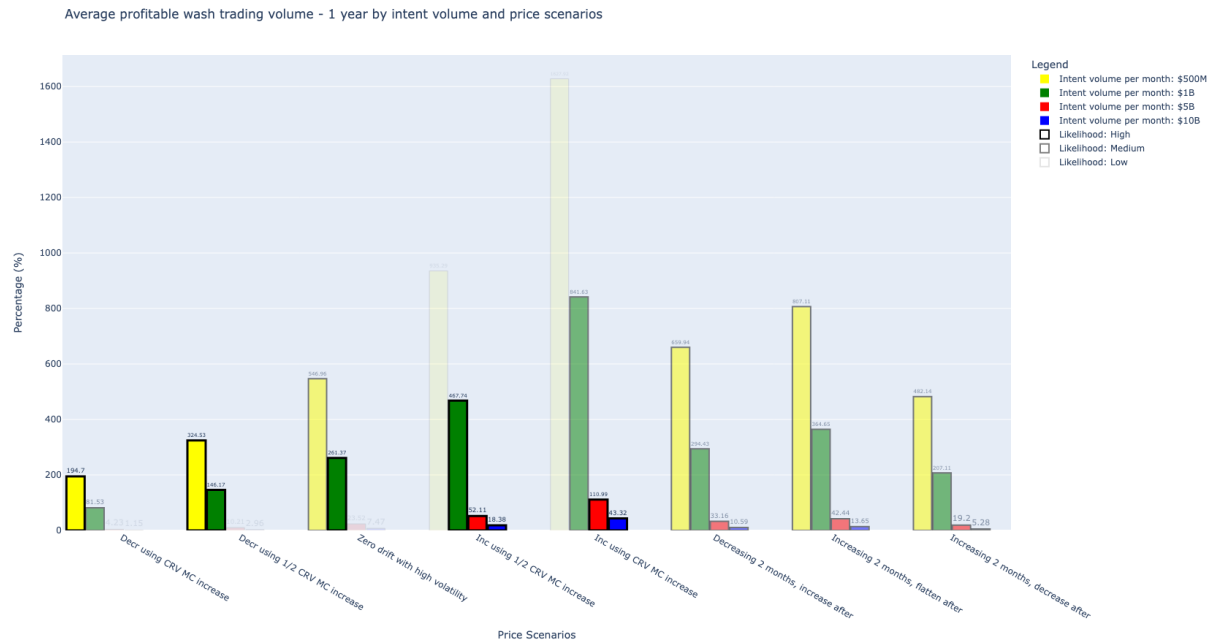


Figure 8: Average profitable wash trade volume over 1 year at 5% emission rate

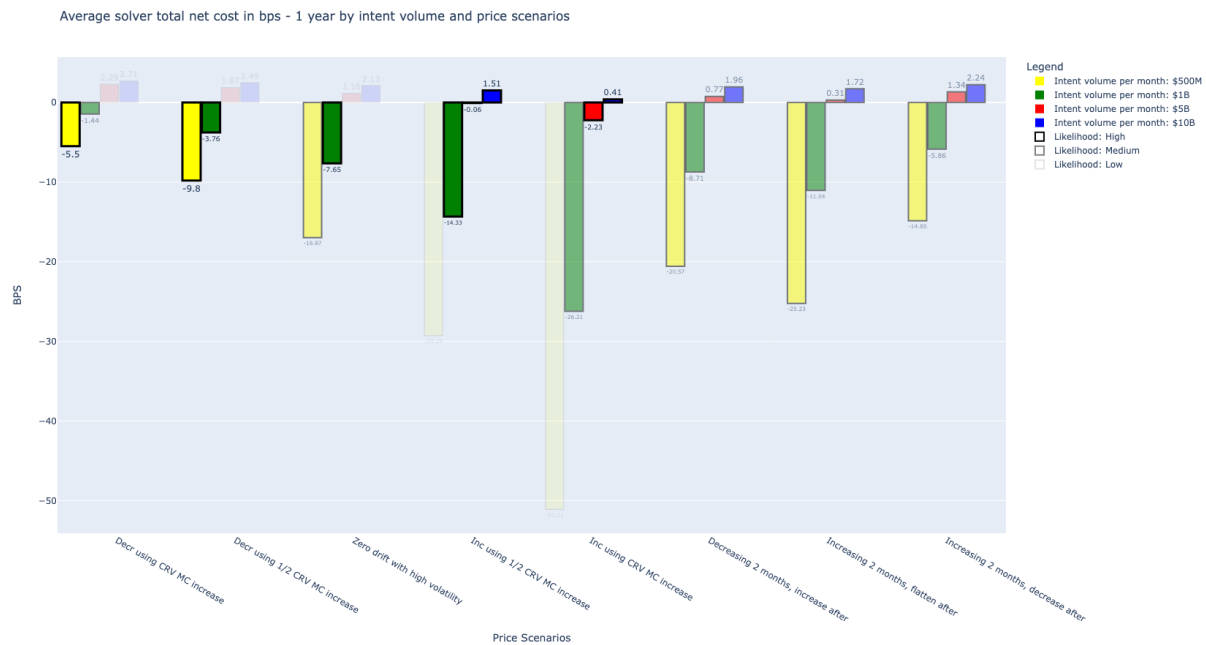


Figure 9: Average solver net cost in bps over 1 year at 5% emission rate

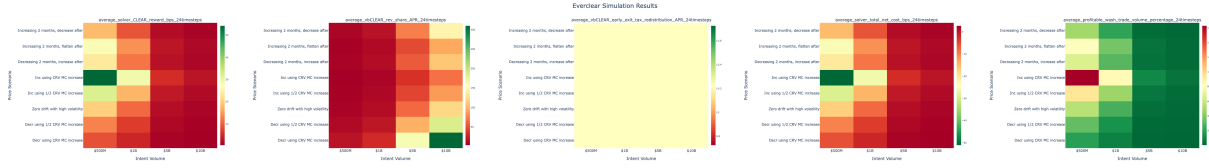


Figure 10: Heatmap of all metrics across scenarios r at 5% emission rate

D Additional plots for Simulation Results using 11.8% emission rate

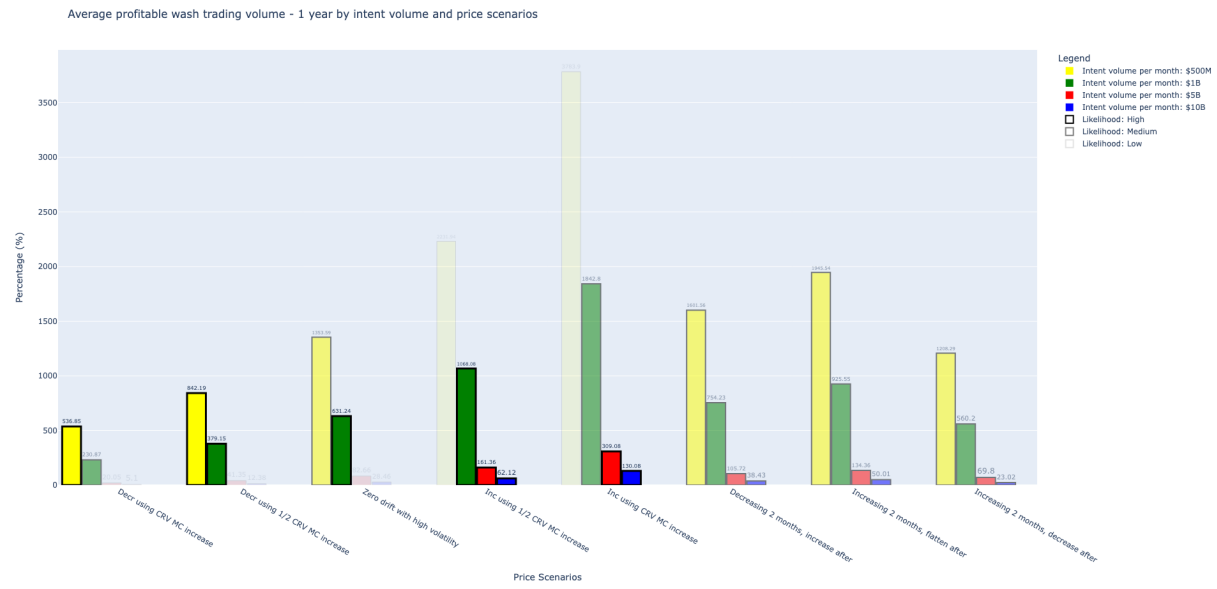


Figure 11: Average profitable wash trade volume over 1 year at 11.8% emission rate

E Scenario plots for stress testing

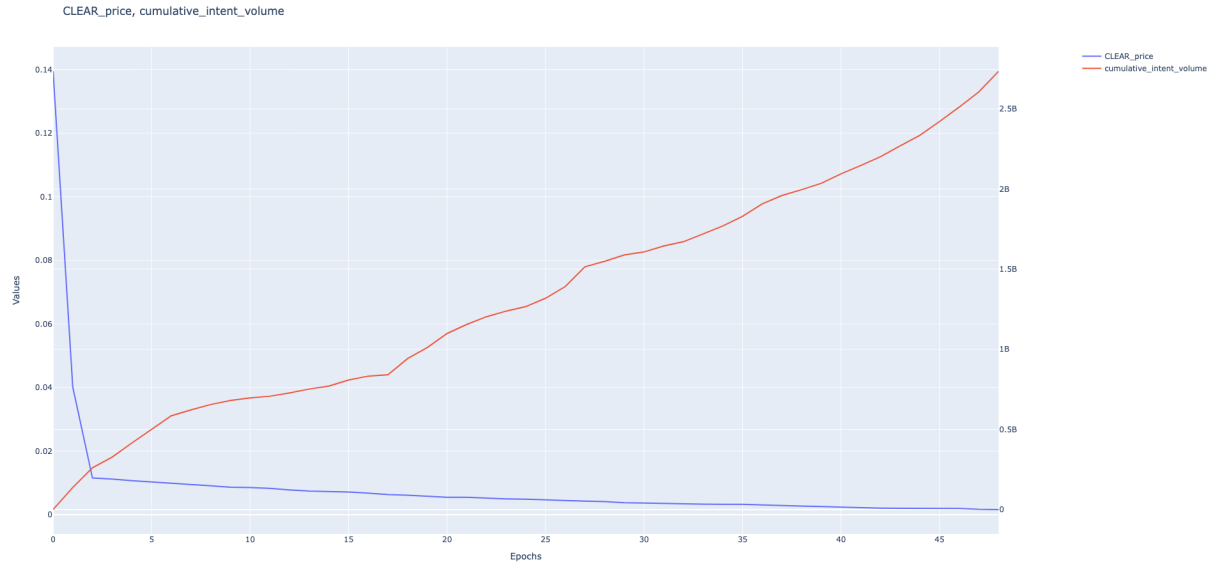


Figure 12: Averaged price and intent volume trend over the stress scenario

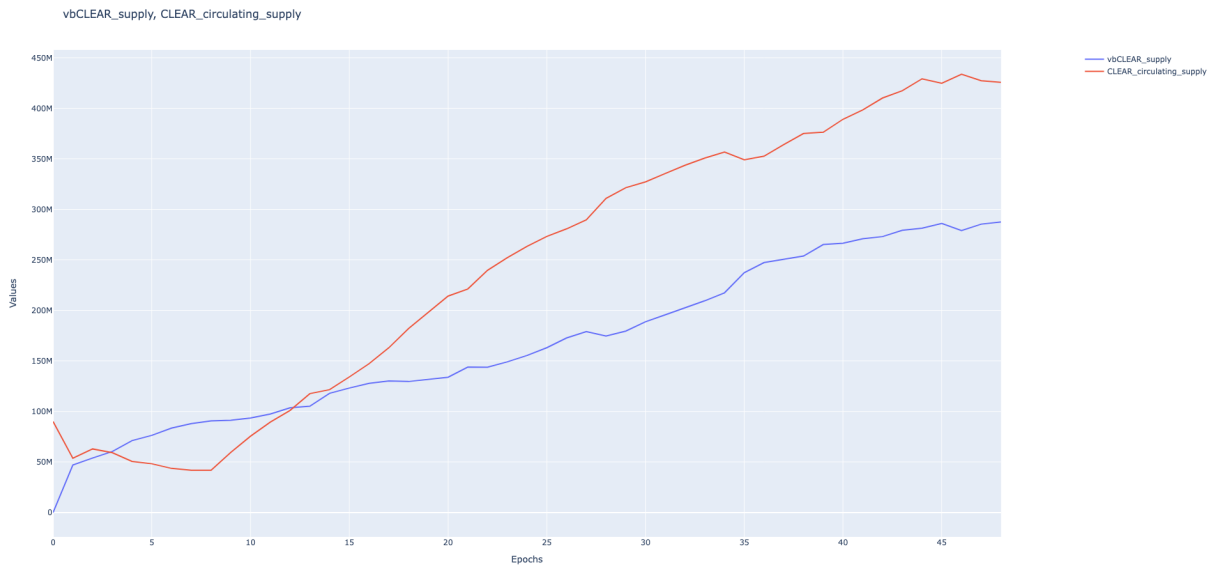


Figure 13: Averaged NEXT and vbNEXT supply over the stress scenario