SECO
Master Variable and Metadata Dictionary

215 atomic variables - as-built governance register
Generic Base Model v1.4.0 | FINAL / HASH-FROZEN | 14 October 2026

Authority	As-built against SECO Generic Base Model v1.4.0 Released
Authoritative workbook	SECO_Generic_Base_Model_v1.4.0_Released.xlsx
Workbook SHA-256	5e2a58ef61cbca0493f100c6c79ec71233eaa13c9efae99a8f8f4979c6128260
Governed architecture	26 worksheets; 25-sheet core + protected 41_Decomposition; 115 equations; 215 atomic variables; 62 hard tests
Formula population	455,849 formula cells; zero external links; zero cached Excel formula errors
Scenario architecture	BASE / POLICY_OFF / NATURAL_SCHEDULE / CUSTOM + company-neutral G01-G12; precedence Sensitivity > Custom > matching Scenario > Base

1. Scope and authority

This dictionary is the v1.4.0 master variable authority. The 215 atomic rows below are transcribed from 02_Governance_Register in the hash-frozen executable. N and ModelStart remain visible non-atomic structural controls and do not change the atomic-variable count.

2. v1.4.0 promoted variables

Four variables that previously existed only in case/calibration work were promoted into the generic governed architecture. Their generic defaults are intentionally company-neutral.

Variable ID	Name / Symbol	Grain	Unit	Bounds	Scen.	Sens.	Consumers	Generic default
SECO-VAR-POL-031	Section 48D Eligible CapEx Ratio / ITCEligibleCapExRatio_l,a	Location x Asset Category	fraction	0 to 1	Yes	Yes	SECO-EQ-POL-001	A/B: Building 0.95; Process Infrastructure 0.95; Equipment 1.00; Campus/Shared 0.90
SECO-VAR-TAX-017	Bonus / Immediate Expensing Fraction / BonusExpensingFraction_l,a	Location x Asset Category	fraction	0 to 1	Yes	Yes	SECO-EQ-TAX-001; SECO-EQ-TAX-002	0 for all A/B asset-category instances
SECO-VAR-REV-010	ASP Phase-Age Mature Multiplier / ASPPhaseAgeMatureMultiplier_p	Phase	index	>0	Yes	Yes	SECO-EQ-REV-003	1.0 for P1-P10
SECO-VAR-REV-011	ASP Phase-Age Transition Month / ASPPhaseAgeTransitionMonth_p	Phase	months	integer >=0	Yes	Yes	SECO-EQ-REV-003	0 model months for P1-P10

3. Non-atomic structural controls

Control	Atomic ID	Current default/state	Rule
N	None - non-atomic	3	Controls P1-P10 activation; integer 1..10.
ModelStart	None - non-atomic	2026-01-01	Optional runtime calendar-start override; Natural Schedule may derive start when blank.

4. Full 215-variable register

Main register columns match the long-standing Master Variable and Metadata Dictionary format. Provision state, Source/URL, Source Date, and Evidence Grade remain available in the accompanying CSV and in 02_Governance_Register.

Variable ID	Name / Symbol	Type	Grain	Unit	Requirement	Bounds	Scen.	Sens.	Producer	Consumers	Evidence	Definition / LineageRole
SECO-VAR-ACC-001	Accounting Basis / AccountingBasis_c,k	Input/Intermediate	Asset cohort	currency	USER/CALC / Required	>=0	Yes	Yes	SYSTEM_ACCOUNTING_BASIS_RULE	SECO-EQ-ACC-001	Accounting policy	Book depreciable basis. [LineageRole=ECONOMIC_INPUT] [SystemProducer=SYSTEM_ACCOUNTING_BASIS_RULE] [SourcePrecedence=SYSTEM_ACCOUNTING_BASIS_RULE unless a governed user override is explicitly permitted; active source must be recorded.]
SECO-VAR-ACC-002	Accounting Life / AccountingLife_c	Input	Asset class	model months or years; normalized to integer model months	USER / Required	>0; normalized months integer >0	Yes	Yes	User Input	SECO-EQ-ACC-001	User / accounting policy	Book depreciation life; cash-flow invariant. [LineageRole=ECONOMIC_INPUT] NormalizeModelMonths is mandatory before equation use.
SECO-VAR-ACC-003	Accounting Depreciation / AD_c,k,t	Intermediate	Asset cohort × Month	currency/month	CALC / Required	>=0	No	No	SECO-EQ-ACC-001	SECO-EQ-ACC-002	Derived	Book depreciation capped at basis. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-ACC-004	Book Value / BookValue_c,k,t	Output	Asset cohort × Month	currency	CALC / Required	>=0	No	No	SECO-EQ-ACC-002	Reporting	Derived	Accounting book value only. [LineageRole=OUTPUT]
SECO-VAR-ACC-005	EBITDA / EBITDA_l,t	Output	Location × Month	currency/month	CALC / Required	Signed	No	No	SECO-EQ-ACC-003	SECO-EQ-ACC-004; reporting	Derived	Revenue less manufacturing cash cost. [LineageRole=OUTPUT]
SECO-VAR-ACC-006	EBIT / EBIT_l,t	Output	Location × Month	currency/month	CALC / Required	Signed	No	No	SECO-EQ-ACC-004	Reporting	Derived	EBITDA less accounting depreciation. [LineageRole=OUTPUT]
SECO-VAR-AUD-001	Hard Test Status / HardTestStatus_j	Audit	Test	enum	CALC/TEST / Required	PASS/FAIL/NOT RUN/N/A	No	No	SECO runner	SECO-EQ-AUD-001	Test evidence	Execution result for each hard acceptance test. [LineageRole=AUDIT]
SECO-VAR-AUD-002	Warning Count / WarningCount	Output	Model	count	CALC / Required	>=0	No	No	SYSTEM_WARNING_ENGINE	Dashboard	Derived	Count of non-release-blocking warnings. [LineageRole=OUTPUT] [SystemProducer=SYSTEM_WARNING_ENGINE]
SECO-VAR-AUD-003	Output Readiness / OutputReadiness_o	Output	Output	status	CALC / Required	READY/INCOMPLETE/NOT READY	No	No	SYSTEM_READINESS_ENGINE	Dashboard	Derived	Output-specific readiness based on missing/open required inputs. [LineageRole=OUTPUT] [SystemProducer=SYSTEM_READINESS_ENGINE]
SECO-VAR-AUD-004	Closure Difference / ClosureDifference_j	Audit	Closure test	native	CALC / Required	Within test tolerance	No	No	Closure equations	SECO status	Derived	Numerical residual used to determine closure-test pass/fail. [LineageRole=AUDIT]
SECO-VAR-BRG-001	Timing Effect by Component / TimingEffect_k	Output	Comparison / Component	currency PV	CALC / Required	Signed; residual near zero	No	No	SECO-EQ-BRG-001	Audit; dashboard	Derived	PV difference from A versus B timing holding A amount constant. [LineageRole=OUTPUT]
SECO-VAR-BRG-002	Amount Effect by Component / AmountEffect_k	Output	Comparison / Component	currency PV	CALC / Required	Signed; residual near zero	No	No	SECO-EQ-BRG-002	Audit; dashboard	Derived	PV difference from A versus B amount holding B timing constant. [LineageRole=OUTPUT]
SECO-VAR-BRG-003	Component Resource Gap / Gap_k	Output	Comparison / Component	currency PV	CALC / Required	Signed; residual near zero	No	No	SECO-EQ-BRG-003	Audit; dashboard	Derived	Timing plus amount effect for resource component. [LineageRole=OUTPUT]
SECO-VAR-BRG-004	Resource Bridge Residual / ResourceBridgeResidual	Output	Comparison / Component	currency PV	CALC / Required	Signed; residual near zero	No	No	SECO-EQ-BRG-004	Audit; dashboard	Derived	DeltaLRC less sum of component gaps. [LineageRole=OUTPUT]
SECO-VAR-BRG-005	Investor Bridge Residual Pre / InvestorBridgeResidual_Pre	Output	Comparison / Component	currency PV	CALC / Required	Signed; residual near zero	No	No	SECO-EQ-BRG-005	Audit; dashboard	Derived	ILD_Pre less pre-policy bridge components. [LineageRole=OUTPUT]
SECO-VAR-BRG-006	Investor Bridge Residual Post / InvestorBridgeResidual_Post	Output	Comparison / Component	currency PV	CALC / Required	Signed; residual near zero	No	No	SECO-EQ-BRG-006	Audit; dashboard	Derived	ILD_Post less reconstructed post-policy bridge. [LineageRole=OUTPUT]
SECO-VAR-BRG-007	Component PV A / ComponentPV_A,k	Intermediate	Component	currency PV	CALC / Required	Signed	No	No	SECO-EQ-BRG-007	SECO-EQ-BRG-001	Derived	Authoritative A component PV used only for attribution. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-BRG-008	Component PV B / ComponentPV_B,k	Intermediate	Component	currency PV	CALC / Required	Signed	No	No	SECO-EQ-BRG-007	SECO-EQ-BRG-001	Derived	Authoritative B component PV used only for attribution. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-BRG-009	Amount Control A/B / AmountControl_l,k	Intermediate	Location × Component	native amount	CALC / Conditional	Defined for separable components	No	No	SECO-EQ-BRG-008	SECO-EQ-BRG-001	Derived	Undiscounted amount/control total for separable bridge component. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-BRG-010	Timing Weight A/B / TimingWeight_l,k,t	Intermediate	Location × Component × Month	fraction	CALC / Conditional	0 to 1; sums to 1 if amount nonzero	No	No	SECO-EQ-BRG-008	SECO-EQ-BRG-001	Derived	Normalized timing profile for separable component. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-BRG-011	Direct Contribution / DirectContribution_k	Output	Component	currency PV	CALC / Conditional	Signed	No	No	SECO-EQ-BRG-009	SECO-EQ-BRG-005	Derived	Sign-normalized direct contribution for non-separable channel. [LineageRole=OUTPUT]
SECO-VAR-BRG-012	Bridge Method / BridgeMethod_k	Metadata	Component	enum	META / Required	SEPARABLE_AMOUNT_TIMING / DIRECT / DRIVER_WATERFALL	No	No	Bridge metadata	Bridge engine	Master Specification - bridge metadata rule	Method allowed for each bridge component. [LineageRole=METADATA]
SECO-VAR-BRG-013	Zero-Side Rule / ZeroSideRule_k	Metadata	Component	enum	META / Required	TIMING_ZERO_AMOUNT_ALL	No	No	Bridge metadata	SECO-EQ-BRG-001	Master Specification - zero-	If one side amount is zero, timing effect is zero and gap is

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											side bridge rule	amount effect. [LineageRole=METADATA]
SECO-VAR-BRG-014	Sign Normalization / SignNormalization_k	Metadata	Component	+1/-1	META / Required	+1 or -1	No	No	Bridge metadata	SECO-EQ-BRG-009	Master Specification - sign-normalization rule	Normalizes positive contribution to mean A disadvantage. [LineageRole=METADATA]
SECO-VAR-BRG-015	Policy Differential / PolicyDifferential	Output	Comparison	currency PV	CALC / Conditional	Signed	No	No	SECO-EQ-BRG-010	SECO-EQ-BRG-006	Derived	Difference in investor policy cash favoring B when positive. [LineageRole=OUTPUT]
SECO-VAR-BRG-016	Policy-Tax Interaction Differential / PolicyTaxInteractionDifferential	Output	Comparison	currency PV	CALC / Conditional	Signed	No	No	SECO-EQ-BRG-011	SECO-EQ-BRG-006	Derived	Differential tax consequence induced by policy. [LineageRole=OUTPUT]
SECO-VAR-BRG-017	Avoided Private Cost Differential / AvoidedPrivateCostDifferential	Output	Comparison	currency PV	CALC / Conditional	Signed	No	No	SECO-EQ-BRG-012	SECO-EQ-BRG-006	Derived	Differential investor capital relief. [LineageRole=OUTPUT]
SECO-VAR-BRG-018	Bridge Status / BridgeStatus	Audit	Bridge	status	CALC / Required	PASS/FAIL	No	No	SECO-EQ-AUD-001	Dashboard; release gate	SECO audit engine / Validation Acceptance Protocol	Bridge closure status. [LineageRole=AUDIT]
SECO-VAR-BRG-019	Bridge Absolute Tolerance / BridgeToleranceAbs	Metadata/Input	Model	currency PV	USER/META / Required	>=0	No	No	User Input	Bridge audit equations	Validation Acceptance Protocol - bridge tolerance governance	Absolute numerical tolerance for bridge closure; not an economic assumption. [LineageRole=METADATA]
SECO-VAR-BRG-020	Bridge Relative Tolerance / BridgeToleranceRel	Metadata/Input	Model	fraction	USER/META / Required	>=0	No	No	User Input	Bridge audit equations	Validation Acceptance Protocol - bridge tolerance governance	Relative numerical tolerance for bridge closure; not an economic assumption. [LineageRole=METADATA]
SECO-VAR-CAP-001	Installed Capacity / IC_l,p	Input	Location × Phase	WSPM	USER / Required	>0	Yes	Yes	User Input	SECO-EQ-CAP-001; SECO-EQ-CAP-003	User / empirical	Nominal installed wafer-start capacity. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-CAP-002	HVM Availability Fraction / AF_HVM_l,p	Input	Location × Phase	fraction	USER / Required	0 to 1	Yes	Yes	User Input	SECO-EQ-CAP-001; SECO-EQ-CAP-002	User / empirical	Fraction of installed capacity available at HVM. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-CAP-003	Availability Ramp Months / AvailabilityRamp_l,p	Input	Location × Phase	integer model months	USER / Required	integer >=0	Yes	Yes	User Input	SECO-EQ-CAP-002; SECO-EQ-TIM-009	User / empirical	Months from HVM availability to full availability. 0 = instantaneous full availability at/after HVM; negative invalid. [LineageRole=ECONOMIC_INPUT] Discrete monthly engine requires an integer model-month count.
SECO-VAR-CAP-004	Availability Fraction / AF_l,p,t	Intermediate	Location × Phase × Month	fraction	CALC / Required	0 to 1	No	No	SECO-EQ-CAP-002	SECO-EQ-CAP-003	Derived	Monthly installed-capacity availability. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-CAP-005	Installed Capacity Available / ICA_l,p,t	Intermediate	Location × Phase × Month	WSPM	CALC / Required	>=0	No	No	SECO-EQ-CAP-003	SECO-EQ-CAP-005; SECO-EQ-LFC-005	Derived	Installed capacity physically available in the month. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-CAP-006	CE at HVM / CE_HVM_l,p	Input	Location × Phase	index	USER / Required	>0	Yes	Yes	User Input	SECO-EQ-CAP-004	User / empirical	Capacity-efficiency index at HVM. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-CAP-007	CE Steady State / CE_SS_l,p	Input	Location × Phase	index	USER / Required	>0	Yes	Yes	User Input	SECO-EQ-CAP-004	User / empirical	Steady-state engineering capacity-efficiency index; may exceed 1. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-CAP-008	CE Ramp Months / CERampMonths_l,p	Input	Location × Phase	integer model months	USER / Required	integer >=0	Yes	Yes	User Input	SECO-EQ-CAP-004; SECO-EQ-TIM-009	User / empirical	Capacity-efficiency ramp duration. 0 = instantaneous CE_SS at/after HVM; negative invalid. [LineageRole=ECONOMIC_INPUT] Discrete monthly engine requires an integer model-month count.
SECO-VAR-CAP-009	Capacity Efficiency / CE_l,p,t	Intermediate	Location × Phase × Month	index	CALC / Required	>0	No	No	SECO-EQ-CAP-004	SECO-EQ-CAP-005	Derived	Engineering productivity relative to nominal installed capacity. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-CAP-010	Effective Capacity / EC_l,p,t	Intermediate	Location × Phase × Month	wafer-start capacity/month	CALC / Required	>=0	No	No	SECO-EQ-CAP-005	SECO-EQ-CAP-007	Derived	Available installed capacity adjusted for engineering efficiency. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-CAP-011	Utilization at HVM / U_HVM_l,p	Input	Location × Phase	fraction	USER / Required	0 to 1	Yes	Yes	User Input	SECO-EQ-CAP-006	User / empirical	Operating utilization at HVM. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-CAP-012	Utilization Steady State / U_SS_l,p	Input	Location × Phase	fraction	USER / Required	0 to 1	Yes	Yes	User Input	SECO-EQ-CAP-006	User / empirical	Steady-state utilization. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-CAP-013	Utilization Ramp Months / URampMonths_l,p	Input	Location × Phase	integer model months	USER / Required	integer >=0	Yes	Yes	User Input	SECO-EQ-CAP-006; SECO-EQ-TIM-009	User / empirical	Utilization ramp duration. 0 = instantaneous U_SS at/after HVM; negative invalid. [LineageRole=ECONOMIC_INPUT] Discrete monthly engine requires an integer model-month count.
SECO-VAR-CAP-014	Operating Utilization / U_l,p,t	Intermediate	Location × Phase × Month	fraction	CALC / Required	0 to 1	No	No	SECO-EQ-CAP-006	SECO-EQ-CAP-007	Derived	Monthly loading of effective capacity. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-CAP-015	Wafer Starts / WS_l,p,t	Intermediate	Location × Phase × Month	wafers/month	CALC / Required	>=0	No	No	SECO-EQ-CAP-007	SECO-EQ-CAP-008; SECO-EQ-OPE-002; SECO-EQ-OPE-006	Derived	Physical wafer starts. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-CAP-016	Cycle Time / CT_l,p	Input	Location × Phase	integer model months	USER / Required	integer >=0	Yes	Yes	User Input	SECO-EQ-CAP-008	User / empirical	Manufacturing cycle-time lag from starts to completions. [LineageRole=ECONOMIC_INPUT] Fractional cycle-time lags are invalid in v1.0; no silent rounding/interpolation.
SECO-VAR-CAP-017	Wafer Completions / WC_l,p,t	Intermediate	Location × Phase × Month	wafers/month	CALC / Required	>=0	No	No	SECO-EQ-CAP-008	SECO-EQ-CAP-009; SECO-EQ-CAP-012	Derived	Physical wafer completions. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-CAP-018	Ending WIP / WIP_End_l,p,t	Intermediate	Location × Phase × Month	wafers	CALC / Required	>=0	No	No	SECO-EQ-CAP-009	SECO-EQ-CAP-010	Derived	Ending physical work in process. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-CAP-019	EYI at HVM / EYI_HVM_l,p	Input	Location × Phase	index	USER / Required	>=0	Yes	Yes	User Input	SECO-EQ-CAP-011	User / empirical	Economic Yield Index at HVM. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-CAP-020	EYI Steady State / EYI_SS_l,p	Input	Location × Phase	index	USER / Required	>=0	Yes	Yes	User Input	SECO-EQ-CAP-011	User / empirical	Steady-state Economic Yield Index. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-CAP-021	EYI Ramp Months / EYIRampMonths_l,p	Input	Location × Phase	integer model months	USER / Required	integer >=0	Yes	Yes	User Input	SECO-EQ-CAP-011; SECO-EQ-TIM-009	User / empirical	EYI ramp duration. 0 = instantaneous EYI_SS at/after HVM; negative invalid. [LineageRole=ECONOMIC_INPUT] Discrete monthly engine requires an integer model-month count.
SECO-VAR-CAP-022	Economic Yield Index / EYI_l,p,t	Intermediate	Location × Phase × Month	index	CALC / Required	>=0	No	No	SECO-EQ-CAP-011	SECO-EQ-CAP-012	Derived	Economic monetizable-output index; not proprietary die yield. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-CAP-023	Economic Output / EO_l,p,t	Intermediate	Location × Phase × Month	economic wafer equivalents/month	CALC / Required	>=0	No	No	SECO-EQ-CAP-012	SECO-EQ-REV-001	Derived	Economically monetizable wafer-equivalent output. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-CAP-024	Opening WIP / OpeningWIP_l,p	Input	Location × Phase	wafers	USER / Required	≥0; default 0 greenfield	Yes	Yes	User Input	SECO-EQ-CAP-013	User / case evidence	Opening physical WIP stock. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-CAP-025	Beginning WIP / WIP_Begin_l,p,t	Intermediate	Location × Phase × Month	wafers	CALC / Required	≥0	No	No	SECO-EQ-CAP-013	SECO-EQ-CAP-009	Derived	Beginning physical WIP stock. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-CEX-001	Building CapEx / BuildingCapEx_l,p	Input	Location × Phase	currency	USER / Required	>=0	Yes	Yes	User Input	SECO-EQ-CEX-001; SECO-EQ-CEX-004	User / empirical	Gross physical capital control total; never net of policy. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-CEX-002	Process Infrastructure CapEx / ProcessInfrastructureCapEx_l,p	Input	Location × Phase	currency	USER / Required	>=0	Yes	Yes	User Input	SECO-EQ-CEX-001; SECO-EQ-CEX-004	User / empirical	Gross physical capital control total; never net of policy. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-CEX-003	Equipment CapEx / EquipmentCapEx_l,p	Input	Location × Phase	currency	USER / Required	>=0	Yes	Yes	User Input	SECO-EQ-CEX-001; SECO-EQ-CEX-004	User / empirical	Gross physical capital control total; never net of policy. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-CEX-004	Campus / Shared Infrastructure CapEx / CampusSharedInfrastructure_l,p	Input	Location × Phase	currency	USER / Required	>=0	Yes	Yes	User Input	SECO-EQ-CEX-001; SECO-EQ-CEX-004	User / empirical	Gross physical capital control total; never net of policy. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-CEX-005	Private Soft Cost / PrivateSoftCost_l,p	Input	Location × Phase	currency	USER / Required	>=0	Yes	Yes	User Input	SECO-EQ-CEX-002	User / empirical	Investor-paid nonphysical development/soft cost. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-CEX-006	Private Soft Resource / PrivateSoftResource_l,p	Input	Location × Phase	currency	USER / Required	>=0	Yes	Yes	User Input	SECO-EQ-CEX-003; SECO-EQ-RSC-002	User / empirical	Real-resource portion of private soft cost. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-CEX-007	Land Cash Outflow / LandCashOutflow_l,p	Input	Location × Phase	currency	USER / Required	>=0	Yes	Yes	User Input	SECO-EQ-CEX-002	User / empirical	Investor land transaction cash. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-CEX-008	Land Opportunity Cost / LandOpportunityCost_l,p	Input	Location × Phase	currency	USER / Required	>=0	Yes	Yes	User Input	SECO-EQ-CEX-003; SECO-EQ-RSC-002	User / empirical	Resource opportunity cost of land; replaces transaction price in resource view where appropriate. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-CEX-009	Public Enabling Resources / PublicEnablingResources_l,p	Input	Location × Phase	currency	USER / Conditional	>=0 or OPEN	Yes	Yes	User Input	SECO-EQ-CEX-003; SECO-EQ-POL-006; SECO-EQ-RSC-002	Government / empirical	Public infrastructure/resources attributable to the project. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-CEX-010	Physical Fab CapEx / PhysicalFabCapEx_l,p	Intermediate	Location × Phase	currency	CALC / Required	>=0	No	No	SECO-EQ-CEX-001	SECO-EQ-CEX-002	Derived	Sum of four physical capital categories. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-CEX-011	Investor Initial Capital / InvestorInitialCapital_l,p	Intermediate	Location × Phase	currency	CALC / Required	>=0	No	No	SECO-EQ-CEX-002	SECO-EQ-DCF-001	Derived	Gross investor initial capital before policy. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-CEX-012	Initial Resource Capital / InitialResourceCapital_l,p	Intermediate	Location × Phase	currency	CALC / Required	>=0	No	No	SECO-EQ-CEX-003	SECO-EQ-RSC-002	Derived	Real-resource initial capital. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-CEX-013	Spend Curve / SpendCurve_l,p,c	Input	Location × Phase × Component	enum/path	USER / Required	Allowed curve IDs / custom	Yes	Yes	User Input	SECO-EQ-CEX-004	User / empirical	Governed shape of component cash spending. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-CEX-014	Spend Share / SpendShare_l,p,c,t	Intermediate	Location × Phase × Component × Month	fraction	CALC / Required	0 to 1; sum=1	No	No	SECO-EQ-CEX-004	SECO-EQ-CEX-005	Derived	Normalized monthly spend share. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-CEX-015	Monthly Component CapEx / CapEx_l,p,c,t	Intermediate	Location × Phase × Component × Month	currency assigned to model month t	CALC / Required	>=0	No	No	SECO-EQ-CEX-005	SECO-EQ-CEX-006; SECO-EQ-DCF-012; SECO-EQ-DCF-001; SECO-EQ-DCF-002; SECO-EQ-RSC-002	Derived	Authoritative dated initial capital cash/resource stream. [LineageRole=ECONOMIC_INTERMEDIATE] Discrete monthly period amount, not a continuous rate.
SECO-VAR-CEX-016	Materiality Threshold / MaterialityThreshold	Input	Model	currency/fraction	USER / Required	>=0	Yes	Yes	User Input	SECO-EQ-CEX-007	User	Threshold defining first material private commitment. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-CEX-017	First Material Private Cash Outflow / FMPCO_l,p	Intermediate	Location × Phase	date	CALC / Required	Valid date	No	No	SECO-EQ-CEX-007	SECO-EQ-TIM-010	Derived	Date cumulative private capital first crosses materiality threshold. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-DCF-001	Investor Hurdle Rate / r_I	Input	Model	fraction/year	USER / Required	>-1	Yes	Yes	User Input	SECO-EQ-DCF-003	User	Investor discount/hurdle rate; independent of resource discount rate. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-DCF-002	NWC Percent of Revenue / NWCPercent	Input	Model/Location	fraction	USER / Optional	>=0	Yes	Yes	User Input	SECO-EQ-DCF-010	User / empirical	Working-capital requirement as share of revenue when module active. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-DCF-003	NWC Balance / NWC_l,t	Intermediate	Location × Month	currency	CALC / Conditional	>=0	No	No	SECO-EQ-DCF-010	SECO-EQ-DCF-011	Derived	Working-capital balance. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-DCF-004	Change in NWC / DeltaNWC_l,t	Intermediate	Location × Month	currency/month	CALC / Conditional	Signed	No	No	SECO-EQ-DCF-011	SECO-EQ-DCF-001	Derived	Monthly working-capital cash investment/release. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-DCF-005	Pre-Policy FCF / FCF_Pre_l,t	Intermediate	Location × Month	currency/month	CALC / Required	Signed	No	No	SECO-EQ-DCF-001	SECO-EQ-DCF-004	Derived	Authoritative investor free cash flow before policy. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-DCF-006	Post-Policy FCF / FCF_Post_l,t	Intermediate	Location × Month	currency/month	CALC / Required	Signed	No	No	SECO-EQ-DCF-002	SECO-EQ-DCF-005	Derived	Authoritative investor free cash flow after policy. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-DCF-007	Investor Discount Factor / DF_l,t	Intermediate	Month	factor	CALC / Required	>0	No	No	SECO-EQ-DCF-003	SECO-EQ-DCF-004	Derived	Date-specific investor discount factor. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-DCF-008	Pre-Policy NPV / NPV_Pre_l	Headline Output	Location	currency PV	CALC / Required	Signed	No	No	SECO-EQ-DCF-004	SECO-EQ-DCF-006; SECO-EQ-POL-008	Derived	Investor NPV before modeled policy. [LineageRole=ECONOMIC_OUTPUT]

Variable ID	Name / Symbol	Type	Grain	Unit	Requirement	Bounds	Scen.	Sens.	Producer	Consumers	Evidence	Definition / LineageRole
SECO-VAR-DCF-009	Post-Policy NPV / NPV_Post_l	Headline Output	Location	currency PV	CALC / Required	Signed	No	No	SECO-EQ-DCF-005	SECO-EQ-DCF-007; SECO-EQ-POL-008	Derived	Investor NPV after modeled policy. [LineageRole=ECONOMIC_OUTPUT]
SECO-VAR-DCF-010	Investor Location Disadvantage Pre / ILD_Pre	Headline Output	Comparison	currency PV	CALC / Required	Signed	No	No	SECO-EQ-DCF-006	SECO-EQ-POL-009; bridges	Derived	NPV_Pre,B - NPV_Pre,A; positive means A is worse. [LineageRole=ECONOMIC_OUTPUT]
SECO-VAR-DCF-011	Investor Location Disadvantage Post / ILD_Post	Headline Output	Comparison	currency PV	CALC / Required	Signed	No	No	SECO-EQ-DCF-007	Dashboard; bridges	Derived	NPV_Post,B - NPV_Post,A; positive means A is worse. [LineageRole=ECONOMIC_OUTPUT]
SECO-VAR-DCF-012	Working Capital Mode / WorkingCapitalMode	Control	Model	Boolean	USER / Required	ON/OFF	Yes	No	User Input	SECO-EQ-DCF-010	User	Activates working-capital module; OFF forces NWC and ΔNWC to zero. [LineageRole=CONTROL]
SECO-VAR-GOV-001	Active Scenario / ActiveScenario	Control	Model	enum	USER / Required	BASE / named / CUSTOM	No	No	User Input	SECO-EQ-SCN-001; SECO-EQ-SCN-002	Master Specification - scenario governance	Scenario selected for authoritative Run Parameter resolution. [LineageRole=CONTROL]
SECO-VAR-GOV-002	Counterfactual Mode / CounterfactualMode	Control	Model	enum	USER / Required	MATCHED_HVM / NATURAL_SCHEDULE	Yes	No	User Input	SECO-EQ-TIM-003; SECO-EQ-TIM-008	Master Specification - counterfactual governance	MATCHED_HVM: common HVM anchor. NATURAL_SCHEDULE: common Investment Decision Date anchor; HVM endogenous by location. [LineageRole=CONTROL]
SECO-VAR-GOV-003	Forecast Months / ForecastMonths	Input	Model	months	USER / Required	>0 integer	Yes	Yes	User Input	TERMINAL_SYSTEM: SYSTEM_HORIZON_GATE	User / scenario	Number of active forecast months and sole horizon gate. Months outside the governed horizon are excluded without pull-forward; extending the horizon admits events only at their actual dates. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-GOV-004	Investment Decision Date / InvestmentDecisionDate	Input	Project	date	USER / Required	Valid date	Yes	Yes	User Input	SECO-EQ-TIM-002; SECO-EQ-TIM-007	User / case evidence	Common A/B Investment Decision Date and valuation origin d0. NATURAL_SCHEDULE forward anchor; MATCHED_HVM feasibility boundary. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-GOV-005	Model Readiness / ModelReady	Output	Model	status	CALC / Required	READY / NOT READY	No	No	SECO-EQ-AUD-002	Dashboard	SECO-EQ-AUD-002 / SECO release gate	Hard-release readiness status. [LineageRole=OUTPUT]
SECO-VAR-GOV-006	Hard Failure Count / HardFailures	Output	Model	count	CALC / Required	>=0 integer	No	No	SECO-EQ-AUD-001	SECO-EQ-AUD-002; Dashboard	SECO-EQ-AUD-001 / SECO hard-test register	Count of failed hard tests. [LineageRole=OUTPUT]
SECO-VAR-GOV-007	Input State / InputState_i	Metadata	Variable	enum	META / Required	PROVIDED / DEFAULT / OPEN / N/A	No	No	Metadata	TERMINAL_SYSTEM: SYSTEM_READINESS_ENGINE	Master Specification - input-state metadata rule	Distinguishes explicit zero from missing/open information. [LineageRole=METADATA]
SECO-VAR-GOV-008	Evidence Grade / EvidenceGrade_i	Metadata	Variable	grade	META / Conditional	A / B / C / D / OPEN	No	No	Metadata	TERMINAL_SYSTEM: WARNING_DOCUMENTATION_ENGINE	Source-dependent	Evidence-quality classification for empirical assumptions. [LineageRole=METADATA]
SECO-VAR-GOV-009	Materiality Class / Materiality_i	Metadata	Variable	enum	META / Required	HIGH / MEDIUM / LOW	No	No	Metadata	TERMINAL_SYSTEM: EVIDENCE_READINESS_WARNING_ENGINE	Master Specification - materiality metadata rule	Determines governance rigor for assumptions. [LineageRole=METADATA]
SECO-VAR-LFC-001	Economic Life / EconomicLife_c	Input	Asset class	model months or years; normalized to integer model months	USER / Required	>0; normalized months integer >0	Yes	Yes	User Input	SECO-EQ-LFC-002	User / empirical	Economic replacement life; independent of accounting/tax lives. [LineageRole=ECONOMIC_INPUT] NormalizeModelMonths is mandatory before replacement-date arithmetic.
SECO-VAR-LFC-002	Replacement Fraction / ReplacementFraction_c	Input	Asset class	fraction	USER / Required	0 to 1	Yes	Yes	User Input	SECO-EQ-LFC-001	User / empirical	Fraction of asset base replaced at economic-life event. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-LFC-003	Replacement Window / ReplacementWindow_c	Input	Asset class	months	USER / Required	>=1	Yes	Yes	User Input	SECO-EQ-LFC-003	User / empirical	Months over which replacement expenditure is spread. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-LFC-004	Placed-in-Service Date / PlacedInService_c,k	Intermediate/Input	Asset cohort	date	CALC/USER / Required	Valid date	Yes	Yes	SYSTEM_CAPITAL_COHORT_ENGINE	SECO-EQ-LFC-002; SECO-EQ-ACC-001; SECO-EQ-TAX-002	Derived / evidence	Asset cohort service date. [LineageRole=ECONOMIC_INPUT] [SystemProducer=SYSTEM_CAPITAL_COHORT_ENGINE] [SourcePrecedence=SYSTEM_CAPITAL_COHORT_ENGINE unless a governed user override is explicitly permitted; active source must be recorded and reset-restorable.]
SECO-VAR-LFC-005	Replacement Asset Base / ReplacementAssetBase_c,k	Intermediate	Asset cohort	currency	CALC / Required	>=0	No	No	SYSTEM_CAPITAL_COHORT_ENGINE	SECO-EQ-LFC-001	Derived	Asset base subject to economic replacement. [LineageRole=ECONOMIC_INTERMEDIATE] [SystemProducer=SYSTEM_CAPITAL_COHORT_ENGINE]
SECO-VAR-LFC-006	Replacement Amount / ReplacementAmount_c,k	Intermediate	Asset cohort	currency	CALC / Required	>=0	No	No	SECO-EQ-LFC-001	SECO-EQ-LFC-003	Derived	Control amount for each replacement event. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-LFC-007	Replacement Date / ReplacementDate_c,k	Intermediate	Asset cohort	date	CALC / Required	Valid date	No	No	SECO-EQ-LFC-002	SECO-EQ-LFC-003	Derived	Economic replacement event date. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-LFC-008	Monthly Replacement CapEx / ReplacementCapEx_t	Intermediate	Location × Phase × Asset × Month	currency assigned to model month t	CALC / Required	>=0	No	No	SECO-EQ-LFC-003	SECO-EQ-LFC-004; SECO-EQ-DCF-001; SECO-EQ-DCF-002; SECO-EQ-RSC-002	Derived	Dated sustaining/replacement capital. [LineageRole=ECONOMIC_INTERMEDIATE] Discrete monthly period amount, not a continuous rate.
SECO-VAR-LFC-009	Technology Refresh CapEx / TechnologyRefreshCapEx_t	Input/Path	Location × Phase × Month	currency/month	USER / Optional	>=0	Yes	Yes	User Input	SECO-EQ-LFC-004; SECO-EQ-DCF-001; SECO-EQ-DCF-002; SECO-EQ-RSC-002	User / empirical	Non-routine technology refresh capital separate from economic replacement. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-LFC-010	Residual Value / UserResidualValue_l,p	Input	Location × Phase	currency	USER / Required	>=0 or explicit negative decommissioning elsewhere	Yes	Yes	User Input	SECO-EQ-LFC-006	User / valuation assumption	Explicit terminal residual cash value; not automatically book value. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-LFC-011	Retirement Date / RetirementDate_l,p	Input	Location × Phase	date	USER / Optional	Within/after horizon	Yes	Yes	User Input	SECO-EQ-LFC-005	User / empirical	Date production capacity retires if modeled. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-LFC-012	Decommissioning Mode / DecommissioningMode	Control	Location / Project	Boolean	USER / Required	ON/OFF	Yes	No	User Input	SECO-EQ-LFC-007; SECO-EQ-RSC-006	User	Activates explicit terminal decommissioning modules. [LineageRole=CONTROL]
SECO-VAR-LFC-013	Decommissioning Investor Cash Schedule / DecommissioningCashInput_l,t	Input/Path	Location × Month	currency/month	USER / Conditional	≥0	Yes	Yes	User Input	SECO-EQ-LFC-007	User / empirical	Explicit investor decommissioning cash schedule. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-LFC-014	Decommissioning Resource Schedule / DecommissioningResourceInput_l,t	Input/Path	Location × Month	currency/month	USER / Conditional	≥0	Yes	Yes	User Input	SECO-EQ-RSC-006	User / empirical	Explicit real-resource decommissioning schedule. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-LFC-015	Decommissioning Investor Cash / DecommissioningCash_l,t	Intermediate	Location × Month	currency/month	CALC / Conditional	≥0	No	No	SECO-EQ-LFC-007	SECO-EQ-DCF-001	Derived	Dated investor decommissioning outflow. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-LFC-016	Decommissioning Resource Cost / DecommissioningResource_l,t	Intermediate	Location × Month	currency/month	CALC / Conditional	≥0	No	No	SECO-EQ-RSC-006	SECO-EQ-RSC-002	Derived	Dated real-resource decommissioning cost. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-OPE-001	Headcount / Headcount_l,p,t	Input/Path	Location × Phase × Month	FTE	USER / Required	>=0	Yes	Yes	User Input / path	SECO-EQ-OPE-001; SECO-EQ-OPE-006	User / empirical	Governed operating-cost driver. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-OPE-002	Fully Loaded Cost per Employee / FLCPerEmployee_l,p,t	Input/Path	Location × Phase × Month	currency/FTE/year	USER / Required	>=0	Yes	Yes	User Input / path	SECO-EQ-OPE-001; SECO-EQ-OPE-006	User / empirical	Governed operating-cost driver. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-OPE-003	Variable Labor / VariableLabor_l,p,t	Input/Path	Location × Phase × Month	currency/month	USER / Required	>=0	Yes	Yes	User Input / path	SECO-EQ-OPE-001; SECO-EQ-OPE-006	User / empirical	Governed operating-cost driver. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-OPE-004	Material Cost per Wafer Start / MaterialCostPerStart_l,p,t	Input/Path	Location × Phase × Month	currency/wafer start	USER / Required	>=0	Yes	Yes	User Input / path	SECO-EQ-OPE-001; SECO-EQ-OPE-006	User / empirical	Governed operating-cost driver. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-OPE-005	Fixed Electricity Load / FixedLoadKWh_l,p,t	Input/Path	Location × Phase × Month	kWh/month	USER / Required	>=0	Yes	Yes	User Input / path	SECO-EQ-OPE-001; SECO-EQ-OPE-006	User / empirical	Governed operating-cost driver. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-OPE-006	Variable Electricity per Start / VariableKWhPerStart_l,p,t	Input/Path	Location × Phase × Month	kWh/wafer start	USER / Required	>=0	Yes	Yes	User Input / path	SECO-EQ-OPE-001; SECO-EQ-OPE-006	User / empirical	Governed operating-cost driver. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-OPE-007	Electricity Price / ElectricityPrice_l,t	Input/Path	Location × Phase × Month	currency/kWh	USER / Required	>=0	Yes	Yes	User Input / path	SECO-EQ-OPE-001; SECO-EQ-OPE-006	User / empirical	Governed operating-cost driver. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-OPE-008	Fixed Water Use / FixedWaterUse_l,p,t	Input/Path	Location × Phase × Month	water unit/month	USER / Required	>=0	Yes	Yes	User Input / path	SECO-EQ-OPE-001; SECO-EQ-OPE-006	User / empirical	Governed operating-cost driver. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-OPE-009	Water per Start / WaterPerStart_l,p,t	Input/Path	Location × Phase × Month	water unit/wafer start	USER / Required	>=0	Yes	Yes	User Input / path	SECO-EQ-OPE-001; SECO-EQ-OPE-006	User / empirical	Governed operating-cost driver. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-OPE-010	Water Price / WaterPrice_l,t	Input/Path	Location × Phase × Month	currency/water unit	USER / Required	>=0	Yes	Yes	User Input / path	SECO-EQ-OPE-001; SECO-EQ-OPE-006	User / empirical	Governed operating-cost driver. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-OPE-011	Maintenance Rate / MaintenanceRate_l,p,t	Input/Path	Location × Phase × Month	fraction/year	USER / Required	>=0	Yes	Yes	User Input / path	SECO-EQ-OPE-001; SECO-EQ-OPE-006	User / empirical	Governed operating-cost driver. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-OPE-012	Variable Maintenance per Start / VariableMaintenancePerStart_l,p,t	Input/Path	Location × Phase × Month	currency/wafer start	USER / Required	>=0	Yes	Yes	User Input / path	SECO-EQ-OPE-001; SECO-EQ-OPE-006	User / empirical	Governed operating-cost driver. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-OPE-013	Fixed Overhead / FixedOverhead_l,p,t	Input/Path	Location × Phase × Month	currency/year	USER / Required	>=0	Yes	Yes	User Input / path	SECO-EQ-OPE-001; SECO-EQ-OPE-006	User / empirical	Governed operating-cost driver. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-OPE-014	Variable Overhead per Start / VariableOverheadPerStart_l,p,t	Input/Path	Location × Phase × Month	currency/wafer start	USER / Required	>=0	Yes	Yes	User Input / path	SECO-EQ-OPE-001; SECO-EQ-OPE-006	User / empirical	Governed operating-cost driver. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-OPE-015	Labor Cost / LaborCost_l,p,t	Intermediate	Location × Phase × Month	currency/month	CALC / Required	>=0	No	No	SECO-EQ-OPE-001	SECO-EQ-OPE-007; SECO-EQ-RSC-001; TERMINAL: REPORTING	Derived	Authoritative operating cash-cost output. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-OPE-016	Materials Cost / Materials_l,p,t	Intermediate	Location × Phase × Month	currency/month	CALC / Required	>=0	No	No	SECO-EQ-OPE-002	SECO-EQ-OPE-007; SECO-EQ-RSC-001; TERMINAL: REPORTING	Derived	Authoritative operating cash-cost output. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-OPE-017	Electricity Cost / ElectricityCost_l,p,t	Intermediate	Location × Phase × Month	currency/month	CALC / Required	>=0	No	No	SECO-EQ-OPE-003	SECO-EQ-OPE-007; SECO-EQ-RSC-001; TERMINAL: REPORTING	Derived	Authoritative operating cash-cost output. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-OPE-018	Water Cost / WaterCost_l,p,t	Intermediate	Location × Phase × Month	currency/month	CALC / Required	>=0	No	No	SECO-EQ-OPE-004	SECO-EQ-OPE-007; SECO-EQ-RSC-001; TERMINAL: REPORTING	Derived	Authoritative operating cash-cost output. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-OPE-019	Maintenance Cost / Maintenance_l,p,t	Intermediate	Location × Phase × Month	currency/month	CALC / Required	>=0	No	No	SECO-EQ-OPE-005	SECO-EQ-OPE-007; SECO-EQ-RSC-001; TERMINAL: REPORTING	Derived	Authoritative operating cash-cost output. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-OPE-020	Overhead Cost / Overhead_l,p,t	Intermediate	Location × Phase × Month	currency/month	CALC / Required	>=0	No	No	SECO-EQ-OPE-006	SECO-EQ-OPE-007; SECO-EQ-RSC-001; TERMINAL: REPORTING	Derived	Authoritative operating cash-cost output. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-OPE-021	Manufacturing Cash Cost / MfgCashCost_l,p,t	Intermediate	Location × Phase × Month	currency/month	CALC / Required	>=0	No	No	SECO-EQ-OPE-007	SECO-EQ-DCF-001; SECO-EQ-DCF-002; SECO-EQ-RSC-001; TERMINAL: REPORTING	Derived	Authoritative operating cash-cost output. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-OPE-022	Location Cost Ratio / LCR_k,t	Output	Cost category × Month	ratio	CALC / Optional	>=0	No	No	SECO-EQ-OPE-008	Calibration/reporting	Derived	A/B cost ratio diagnostic; not itself an economic driver unless explicitly used as an input architecture. [LineageRole=OUTPUT]
SECO-VAR-POL-001	Policy Type / PolicyType_j	Metadata	Policy instrument	enum	USER/META / Conditional	Allowed policy types	Yes	Yes	User Input / metadata	SECO-EQ-POL-001; SECO-EQ-POL-010; SECO-EQ-TAX-001	Law / award / user	Governed policy-instrument field. [LineageRole=METADATA]
SECO-VAR-POL-002	Policy Status / PolicyStatus_j	Metadata	Policy instrument	enum	USER/META / Conditional	ENACTED / AWARDED / ANNOUNCED / HYPOTHETICAL	Yes	Yes	User Input / metadata	SECO-EQ-POL-001; SECO-EQ-POL-010; SECO-EQ-TAX-001	Law / award / user	Governed policy-instrument field. [LineageRole=METADATA]
SECO-VAR-POL-003	Policy Rate / PolicyRate_j	Input	Policy instrument	fraction	USER/META / Conditional	>=0	Yes	Yes	User Input / metadata	SECO-EQ-POL-001; SECO-EQ-POL-010; SECO-EQ-TAX-001	Law / award / user	Governed policy-instrument field. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-POL-004	Policy Cap / PolicyCap_j	Input	Policy instrument	currency	USER/META / Conditional	>=0	Yes	Yes	User Input / metadata	SECO-EQ-POL-001; SECO-EQ-POL-010; SECO-EQ-TAX-001	Law / award / user	Governed policy-instrument field. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-POL-005	Eligibility Fraction /	Input	Policy instrument	fraction	USER/META / Conditional	0 to 1	Yes	Yes	User Input / metadata	SECO-EQ-POL-001; SECO-EQ-POL-010; SECO-EQ-	Law / award / user	Governed policy-instrument field.

Variable ID	Name / Symbol	Type	Grain	Unit	Requirement	Bounds	Scen.	Sens.	Producer	Consumers	Evidence	Definition / LineageRole
	EligibilityFraction_j									TAX-001		[LineageRole=ECONOMIC_INPUT]
SECO-VAR-POL-006	Qualification Date / QualificationDate_j	Input	Policy instrument	date	USER/META / Conditional	Valid date	Yes	Yes	User Input / metadata	SECO-EQ-POL-001; SECO-EQ-POL-010; SECO-EQ-TAX-001	Law / award / user	Governed policy-instrument field. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-POL-007	Eligibility Start / EligibilityStart_j	Input	Policy instrument	date	USER/META / Conditional	Valid date	Yes	Yes	User Input / metadata	SECO-EQ-POL-001; SECO-EQ-POL-010; SECO-EQ-TAX-001	Law / award / user	Governed policy-instrument field. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-POL-008	Eligibility End / Sunset / EligibilityEnd_j	Input	Policy instrument	date	USER/META / Conditional	Valid date	Yes	Yes	User Input / metadata	SECO-EQ-POL-001; SECO-EQ-POL-010; SECO-EQ-TAX-001	Law / award / user	Governed policy-instrument field. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-POL-009	Grandfathering Rule / Grandfathering_j	Input/Metadata	Policy instrument	enum	USER/META / Conditional	Defined rule	Yes	Yes	User Input / metadata	SECO-EQ-POL-001; SECO-EQ-POL-010; SECO-EQ-TAX-001	Law / award / user	Governed policy-instrument field. [LineageRole=METADATA]
SECO-VAR-POL-010	Expected Receipt Fraction / ExpectedReceiptFraction_j	Input	Policy instrument	fraction	USER/META / Conditional	0 to 1	Yes	Yes	User Input / metadata	SECO-EQ-POL-001; SECO-EQ-POL-010; SECO-EQ-TAX-001	Law / award / user	Governed policy-instrument field. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-POL-011	Payment Lag / PaymentLag_j	Input	Policy instrument	integer model months	USER/META / Conditional	integer >=0	Yes	Yes	User Input / metadata	SECO-EQ-POL-001; SECO-EQ-POL-010; SECO-EQ-TAX-001	Law / award / user	Governed policy-instrument field. [LineageRole=ECONOMIC_INPUT] Policy cash lag uses governed ShiftMonths placement; fractional lags invalid in v1.0.
SECO-VAR-POL-012	Basis Reduction Flag / BasisReduction_j	Input	Policy instrument	Boolean	USER/META / Conditional	YES/NO	Yes	Yes	User Input / metadata	SECO-EQ-POL-001; SECO-EQ-POL-010; SECO-EQ-TAX-001	Law / award / user	Governed policy-instrument field. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-POL-013	Taxability Flag / PolicyTaxable_j	Input	Policy instrument	Boolean	USER/META / Conditional	YES/NO	Yes	Yes	User Input / metadata	SECO-EQ-POL-001; SECO-EQ-POL-010; SECO-EQ-TAX-001	Law / award / user	Governed policy-instrument field. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-POL-014	Eligible Basis / EligibleBasis_j	Intermediate	Policy × Location × Phase	currency	CALC / Conditional	>=0	No	No	SECO-EQ-POL-001	SECO-EQ-POL-003	Derived	Policy-eligible project basis. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-POL-015	Policy Eligibility / Eligible_j	Intermediate	Policy instrument	Boolean	CALC / Conditional	TRUE/FALSE	No	No	SECO-EQ-POL-002	SECO-EQ-POL-003	Derived	Qualification outcome under explicit legal rule. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-POL-016	Gross Investment Credit / GrossCredit_j	Intermediate	Policy instrument	currency	CALC / Conditional	>=0	No	No	SECO-EQ-POL-003	SECO-EQ-POL-005; SECO-EQ-TAX-001	Derived	Gross credit before monetization/tax interaction. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-POL-017	Expected Grant / ExpectedGrant_j	Intermediate	Policy instrument	currency	CALC / Conditional	>=0	No	No	SECO-EQ-POL-004	SECO-EQ-POL-005	Derived	Expected grant receipt before timing. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-POL-018	Policy Cash / PolicyCash_j,t	Intermediate	Policy instrument × Month	currency/month	CALC / Conditional	>=0	No	No	SECO-EQ-POL-005	SECO-EQ-DCF-002; SECO-EQ-POL-007	Derived	Dated investor policy receipt. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-POL-019	Government Fiscal Cost / GFC_l,t	Output	Location × Month	currency/month	CALC / Conditional	>=0	No	No	SECO-EQ-POL-006	Fiscal metrics	Derived	Government fiscal burden of modeled policy. [LineageRole=OUTPUT]
SECO-VAR-POL-020	Investor Policy Support / InvestorPolicySupport_l,t	Intermediate	Location × Month	currency/month	CALC / Conditional	Signed/usually >=0	No	No	SECO-EQ-POL-007	TERMINAL: REPORTING; GOVERNED_BRIDGE_INPUT	Derived	Investor-directed support reporting aggregate derived only from governed PolicyCash and cash-tax delta; not consumed by DCF-002. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-POL-021	Policy Value to Investor / PolicyValue_l	Output	Location	currency PV	CALC / Conditional	Signed	No	No	SECO-EQ-POL-008	SECO-EQ-POL-009; bridges	Derived	Difference between post- and pre-policy NPV. [LineageRole=OUTPUT]
SECO-VAR-POL-022	Policy Coverage Ratio / PCR	Output	Comparison	ratio	CALC / Conditional	N/M or signed	No	No	SECO-EQ-POL-009	Dashboard	Derived	Share of pre-policy investor disadvantage covered by differential policy value. [LineageRole=OUTPUT]
SECO-VAR-POL-023	Policy Cash Timing Efficiency / PCTE_l	Output	Location	ratio	CALC / Conditional	0 to 1 generally	No	No	SECO-EQ-POL-010	Dashboard	Derived	PV of policy cash divided by nominal policy cash. [LineageRole=OUTPUT]
SECO-VAR-POL-024	Policy Compatibility Group / CompatibilityGroup_j	Metadata	Policy instrument	enum	META/USER / Conditional	Defined group	Yes	No	Policy metadata	SECO-EQ-POL-011	Law / award	Compatibility classification for stacking. [LineageRole=METADATA]
SECO-VAR-POL-025	Policy Stacking Rule / StackingRule_j	Metadata/Input	Policy instrument	enum	META/USER / Conditional	STACKABLE / EXCLUSIVE / OFFSET / CAPPED	Yes	No	Policy metadata	SECO-EQ-POL-011	Law / award	Rule governing interaction with other policies. [LineageRole=METADATA]
SECO-VAR-POL-026	Policy Stack Valid / PolicyStackValid	Intermediate	Policy package	Boolean	CALC / Conditional	TRUE/FALSE	No	No	SECO-EQ-POL-011	SECO-EQ-POL-012; TERMINAL_SYSTEM: SYSTEM_READINESS_ENGINE	Derived	Whether active policy package is legally/model-wise compatible. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-POL-027	Policy Stack Error / PolicyStackError	Audit	Policy package	0/1	CALC / Conditional	0/1	No	No	SECO-EQ-POL-012	SECO-EQ-AUD-001	Derived	Hard failure for invalid policy stacking. [LineageRole=AUDIT]
SECO-VAR-POL-028	Avoided Private Cost Channel / AvoidedPrivateCostMode	Control	Location	Boolean	USER / Conditional	ON/OFF	Yes	No	User Input	SECO-EQ-POL-013	User / policy design	Enables explicit avoided-private-cost incidence channel. [LineageRole=CONTROL]
SECO-VAR-POL-029	Explicit Avoided Private Cost / ExplicitAvoidedPrivateCost_l,t	Input/Path	Location × Month	currency/month	USER / Conditional	≥0	Yes	Yes	User Input	SECO-EQ-POL-013	Award / empirical	Explicit investor capital cost avoided because of public provision. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-POL-030	Avoided Private Cost / AvoidedPrivateCost_l,t	Intermediate	Location × Month	currency/month	CALC / Conditional	≥0	No	No	SECO-EQ-POL-013	SECO-EQ-DCF-012; SECO-EQ-BRG-012	Derived	Governed investor-incidence stream. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-REV-001	Production-to-Revenue Lag / PRL_l,p	Input	Location × Phase	integer model months	USER / Required	integer >=0	Yes	Yes	User Input	SECO-EQ-REV-001	User / empirical	Lag between economic production completion and revenue recognition. [LineageRole=ECONOMIC_INPUT] Fractional production-to-revenue lags are invalid in v1.0.
SECO-VAR-REV-002	Recognized Economic Output / REO_l,p,t	Intermediate	Location × Phase × Month	economic wafer equivalents/month	CALC / Required	>=0	No	No	SECO-EQ-REV-001	SECO-EQ-REV-004	Derived	Economic output recognized for revenue. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-REV-003	Base ASP / ASP_Base_p	Input	Phase / technology	currency/economic wafer equivalent	USER / Required	>=0	Yes	Yes	User Input	SECO-EQ-REV-002	User / empirical	Reference commercial value per economic wafer equivalent. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-REV-004	ASP Escalation Factor / ASP_EscalationFactor_p,t	Input/Path	Phase × Month	index	USER / Optional	>0	Yes	Yes	User Input / schedule	SECO-EQ-REV-002	User / empirical	Time path applied to base ASP. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-REV-005	Effective ASP / ASP_p,t	Intermediate	Phase × Month	currency/economic wafer equivalent	CALC / Required	>=0	No	No	SECO-EQ-REV-002	SECO-EQ-REV-003	Derived	Reference ASP after time/path adjustment. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-REV-006	Location Price Premium / LPP_l,p,t	Input/Path	Location × Phase × Month	fraction	USER / Required	>-1	Yes	Yes	User Input / scenario	SECO-EQ-REV-003	User / empirical	Commercial location-specific price premium/discount. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-REV-007	Adjusted ASP / ASPAdj_l,p,t	Intermediate	Location × Phase × Month	currency/economic wafer equivalent	CALC / Required	>=0	No	No	SECO-EQ-REV-003	SECO-EQ-REV-004	Derived	Location-adjusted ASP. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-REV-008	Revenue / Revenue_l,p,t	Intermediate	Location × Phase × Month	currency/month	CALC / Required	>=0	No	No	SECO-EQ-REV-004	SECO-EQ-REV-005; SECO-EQ-DCF-001; SECO-EQ-DCF-002; SECO-EQ-DCF-010; SECO-EQ-TAX-003; SECO-EQ-TAX-004	Derived	Phase-level recognized revenue. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-REV-009	Campus Revenue / Revenue_l,t	Intermediate	Location × Month	currency/month	CALC / Required	>=0	No	No	SECO-EQ-REV-005	SECO-EQ-DCF-001; SECO-EQ-ACC-003	Derived	Sum of phase revenue at location. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-RSC-001	Resource Discount Rate / r_S	Input	Model	fraction/year	USER / Required	>-1	Yes	Yes	User Input	SECO-EQ-RSC-003	User	Discount rate for real-resource comparison. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-RSC-002	Operating Resource Cost / OperatingResourceCost_l,t	Intermediate	Location × Month	currency/month	CALC / Required	Signed/usually >=0	No	No	SECO-EQ-RSC-001	SECO-EQ-RSC-002	Derived	Real operating resource use net of transfer pricing. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-RSC-003	Monthly Resource Cost / ResourceCost_l,t	Intermediate	Location × Month	currency assigned to model month t	CALC / Required	Signed/usually >=0	No	No	SECO-EQ-RSC-002	SECO-EQ-RSC-004; TERMINAL: RESOURCE_BRIDGE_ENGINE	Derived	Authoritative real-resource cost stream. [LineageRole=ECONOMIC_INTERMEDIATE] Discrete monthly period amount, not a continuous rate.
SECO-VAR-RSC-004	Resource Discount Factor / DF_S,t	Intermediate	Month	factor	CALC / Required	>0	No	No	SECO-EQ-RSC-003	SECO-EQ-RSC-004	Derived	Date-specific social/resource discount factor. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-RSC-005	Location Resource Cost / LRC_l	Output	Location	currency PV	CALC / Required	Signed/usually >=0	No	No	SECO-EQ-RSC-004	SECO-EQ-RSC-005; dashboard	Derived	PV of real resource cost. [LineageRole=OUTPUT]
SECO-VAR-RSC-006	Location Resource Cost Gap / DeltaLRC	Headline Output	Comparison	currency PV	CALC / Required	Signed	No	No	SECO-EQ-RSC-005	Bridges; dashboard	Derived	LRC_A - LRC_B; positive means A uses more discounted real resources. [LineageRole=ECONOMIC_OUTPUT]
SECO-VAR-SCN-001	Base Value / BaseValue_i	Input	Governed parameter	native	USER / Required	Per parameter	No	No	User Input	SECO-EQ-SCN-001	User / evidence	Protected base-case parameter value. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-SCN-002	Scenario Override / DeclaredOverride_i,s	Input	Parameter × Scenario	native	USER / Optional	Per parameter	No	No	Scenario table	SECO-EQ-SCN-001	User	Declared named-scenario override. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-SCN-003	Scenario-Resolved Value / ScenarioValue_i	Intermediate	Parameter	native	CALC / Required	Per parameter	No	No	SECO-EQ-SCN-001	SECO-EQ-SCN-002	Derived	Base value after named-scenario resolution. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-SCN-004	Custom Override / CustomOverride_i	Input	Parameter	native	USER / Optional	Per parameter	No	No	Custom table	SECO-EQ-SCN-002	User	Explicit custom-scenario override. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-SCN-005	Custom-Resolved Value / CustomValue_i	Intermediate	Parameter	native	CALC / Required	Per parameter	No	No	SECO-EQ-SCN-002	SECO-EQ-SCN-003	Derived	Value after custom override layer. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-SCN-006	Sensitivity Override / SensitivityOverride_i	Input/Temporary	Parameter	native	TEMP / Optional	Per parameter	No	No	Sensitivity runner	SECO-EQ-SCN-003	Sensitivity engine	Temporary test override; never overwrites base/scenario storage. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-SCN-007	Run Value / RunValue_i	Intermediate	Parameter	native	CALC / Required	Per parameter	No	No	SECO-EQ-SCN-003	SECO-EQ-SCN-004; TERMINAL_SYSTEM: GOVERNED_BUSINESS_EQUATION_INPUT_LAYER	Derived	Single authoritative parameter value consumed by engines. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-TAX-001	Tax Mode / TaxMode	Control	Model	Boolean	USER / Required	ON/OFF	Yes	No	User Input	SECO-EQ-TAX-003; SECO-EQ-TAX-010	User	Activates cash-tax engine. [LineageRole=CONTROL]
SECO-VAR-TAX-002	Gross Tax Basis / GrossTaxBasis_c,k	Input/Intermediate	Asset cohort	currency	USER/CALC / Conditional	>=0	Yes	Yes	SYSTEM_TAX_BASIS_RULE	SECO-EQ-TAX-001	Tax rules	Tax basis before policy reductions. [LineageRole=ECONOMIC_INPUT] [SystemProducer=SYSTEM_TAX_BASIS_RULE] [SourcePrecedence=SYSTEM_TAX_BASIS_RULE unless a governed conditional/user override is explicitly permitted; active source must be recorded.]
SECO-VAR-TAX-003	Tax Basis / TaxBasis_c,k	Intermediate	Asset cohort	currency	CALC / Conditional	>=0	No	No	SECO-EQ-TAX-001	SECO-EQ-TAX-002	Derived	Tax depreciable basis after policy interactions. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-TAX-004	Tax Life / TaxLife_c	Input	Asset class	model months or years; normalized to integer model months	USER / Conditional	>0; normalized months integer >0	Yes	Yes	User Input	SECO-EQ-TAX-002	Tax rules / user	Tax depreciation life independent of accounting/economic life. [LineageRole=ECONOMIC_INPUT] NormalizeModelMonths is mandatory before tax depreciation.
SECO-VAR-TAX-005	Tax Depreciation / TD_c,k,t	Intermediate	Asset cohort × Month	currency/month	CALC / Conditional	>=0	No	No	SECO-EQ-TAX-002	SECO-EQ-TAX-003	Derived	Tax depreciation capped at tax basis. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-TAX-006	Corporate Tax Rate / CorporateTaxRate_l,t	Input/Path	Location × Month	fraction	USER / Conditional	0 to 1	Yes	Yes	User Input	SECO-EQ-TAX-009	Tax law / user	Applicable corporate income tax rate. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-TAX-007	NOL Utilization Limit / UtilizationLimit_l,t	Input/Path	Location × Month	currency assigned to model month t	USER / Conditional	0 to 1	Yes	Yes	User Input	SECO-EQ-TAX-006	Tax law / user	Maximum current taxable income offset by NOL. [LineageRole=ECONOMIC_INPUT] Discrete monthly period amount, not a continuous rate.
SECO-VAR-TAX-008	NOL Beginning Balance / NOLBegin_l,t	Intermediate	Location × Month	currency assigned to model month t	CALC / Conditional	>=0	No	No	SECO-EQ-TAX-007	SECO-EQ-TAX-006	Derived	Beginning tax-loss carryforward. [LineageRole=ECONOMIC_INTERMEDIATE] Discrete monthly period amount, not a continuous rate.
SECO-VAR-TAX-009	NOL Generated / NOLGenerated_l,t	Intermediate	Location × Month	currency	CALC / Conditional	>=0	No	No	SECO-EQ-TAX-005	SECO-EQ-TAX-007	Derived	Current-period tax loss added to NOL. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-TAX-010	NOL Used / NOLUsed_l,t	Intermediate	Location × Month	currency	CALC / Conditional	>=0	No	No	SECO-EQ-TAX-006	SECO-EQ-TAX-007	Derived	NOL applied against positive taxable income. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-TAX-011	NOL Ending Balance / NOLEnd_l,t	Intermediate	Location × Month	currency	CALC / Conditional	>=0	No	No	SECO-EQ-TAX-007	SECO-EQ-TAX-006; SECO-EQ-TAX-007; TERMINAL:	Derived	Ending tax-loss carryforward.

Variable ID	Name / Symbol	Type	Grain	Unit	Requirement	Bounds	Scen.	Sens.	Producer	Consumers	Evidence	Definition / LineageRole
										REPORTING		[LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-TAX-012	Cash Tax Pre-Policy / CashTax_Pre_l,t	Intermediate	Location × Month	currency assigned to model month t	CALC / Conditional	>=0	No	No	SECO-EQ-TAX-010	SECO-EQ-DCF-001	Derived	Cash tax absent modeled policy package. [LineageRole=ECONOMIC_INTERMEDIATE] Discrete monthly period amount, not a continuous rate.
SECO-VAR-TAX-013	Cash Tax Post-Policy / CashTax_Post_l,t	Intermediate	Location × Month	currency assigned to model month t	CALC / Conditional	>=0	No	No	SECO-EQ-TAX-010	SECO-EQ-DCF-002	Derived	Cash tax including policy tax interactions. [LineageRole=ECONOMIC_INTERMEDIATE] Discrete monthly period amount, not a continuous rate.
SECO-VAR-TAX-014	NOL Expiration Mode / NOLExpirationMode	Control	Location / tax regime	Boolean	USER / Conditional	ON/OFF	Yes	No	User Input	SECO-EQ-TAX-011	Tax law / user	Controls whether statutory NOL expiration is modeled. [LineageRole=CONTROL]
SECO-VAR-TAX-015	NOL Life / NOLLifeYears	Input	Location / tax regime	years	USER / Conditional	>0 when expiration ON	Yes	Yes	User Input	SECO-EQ-TAX-011	Tax law / user	Statutory NOL cohort life. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-TAX-016	NOL Expired / NOLExpired_l,t	Intermediate	Location × Month	currency	CALC / Conditional	≥0	No	No	SECO-EQ-TAX-011	SECO-EQ-TAX-007	Derived	Unused NOL expiring in period. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-TIM-001	Matched HVM Date / HVM_Matched_p	Input	Phase	date	USER / Conditional	Valid date	Yes	Yes	User Input	SECO-EQ-TIM-003; SECO-EQ-TIM-004	User / case evidence	Common HVM anchor in MATCHED_HVM mode. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-TIM-002	HVM Date / HVM_l,p	Intermediate	Location × Phase	date	CALC / Required	Valid date	No	No	SECO-EQ-TIM-003	SECO-EQ-CAP-001; SECO-EQ-TIM-002; SECO-EQ-TIM-004; SECO-EQ-TIM-008; SECO-EQ-TIM-009; SECO-EQ-TIM-010; TERMINAL: REPORTING	Derived	Authoritative HVM date for each location-phase. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-TIM-003	Preconstruction Duration / PreconDuration_l,p	Input	Location × Phase	integer model months	USER / Required	integer >=0	Yes	Yes	User Input	SECO-EQ-TIM-006; SECO-EQ-TIM-008	Case evidence	Preconstruction duration including governed permitting/site-development scope. [LineageRole=ECONOMIC_INPUT] Discrete monthly engine requires an integer model-month count.
SECO-VAR-TIM-004	Site-Control Shock / SiteControlShock_l,p	Input	Location × Phase	integer model months	USER / Optional	integer >=0	Yes	Yes	User Input	SECO-EQ-TIM-006; SECO-EQ-TIM-008	Case evidence	Non-normal site-control/land delay kept separate from permitting duration. [LineageRole=ECONOMIC_INPUT] Discrete monthly engine requires an integer model-month count.
SECO-VAR-TIM-005	Construction Duration / ConstructionDuration_l,p	Input	Location × Phase	integer model months	USER / Required	integer >0	Yes	Yes	User Input	SECO-EQ-TIM-005; SECO-EQ-TIM-008	Case evidence	Physical construction duration under defined start/end gates. [LineageRole=ECONOMIC_INPUT] Discrete monthly engine requires an integer model-month count.
SECO-VAR-TIM-006	Tool Qualification Duration / ToolQualificationDuration_l,p	Input	Location × Phase	integer model months	USER / Required	integer >=0	Yes	Yes	User Input	SECO-EQ-TIM-004; SECO-EQ-TIM-008	Case evidence	Tool install/qualification duration ending at HVM. [LineageRole=ECONOMIC_INPUT] Discrete monthly engine requires an integer model-month count.
SECO-VAR-TIM-007	Preconstruction Start / PreconStart_l,p	Intermediate	Location × Phase	date	CALC / Required	Valid date	No	No	SECO-EQ-TIM-006	SECO-EQ-TIM-007; TERMINAL_SYSTEM: SOFT_COST_TIMING_ENGINE	Derived	Back-solved or forward schedule preconstruction start. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-TIM-008	Construction Start / ConstructionStart_l,p	Intermediate	Location × Phase	date	CALC / Required	Valid date	No	No	SECO-EQ-TIM-005	SECO-EQ-TIM-006; TERMINAL_SYSTEM: CAPEX_TIMING_ENGINE	Derived	Authoritative construction-start milestone. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-TIM-009	Tool Start / ToolStart_l,p	Intermediate	Location × Phase	date	CALC / Required	Valid date	No	No	SECO-EQ-TIM-004	SECO-EQ-TIM-005; TERMINAL_SYSTEM: EQUIPMENT_TIMING_ENGINE	Derived	Authoritative tool-installation start. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-TIM-010	Counterfactual Feasibility / Feasible_l,p	Intermediate	Location × Phase	Boolean	CALC / Required	TRUE/FALSE	No	No	SECO-EQ-TIM-007	TERMINAL_SYSTEM: SYSTEM_READINESS_ENGINE; TERMINAL: DASHBOARD	Derived	Whether selected counterfactual can coexist with decision-date constraint. [LineageRole=ECONOMIC_INTERMEDIATE]
SECO-VAR-TIM-011	Capital Commitment Lead Time / CCLT_l,p	Output	Location × Phase	months	CALC / Required	Signed/positive diagnostic	No	No	SECO-EQ-TIM-010	Dashboard; bridges	Derived	Months between first material private commitment and HVM. [LineageRole=OUTPUT]
SECO-VAR-TIM-012	Steady-State Date / SteadyStateDate_l,p	Output	Location × Phase	date	CALC / Required	Valid date	No	No	SECO-EQ-TIM-009	Reporting	Derived	Date all selected physical ramps reach steady state. [LineageRole=OUTPUT]
SECO-VAR-POL-031	Section 48D Eligible CapEx Ratio / ITCEligibleCapExRatio_l,a	Input	Location x Asset Category	fraction	USER / Required	0 to 1	Yes	Yes	User Input	SECO-EQ-POL-001	User / case-specific tax-policy eligibility	Governed eligible-CapEx ratio by location and asset category. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-TAX-017	Bonus / Immediate Expensing Fraction / BonusExpensingFraction_l,a	Input	Location x Asset Category	fraction	USER / Required	0 to 1	Yes	Yes	User Input	SECO-EQ-TAX-001; SECO-EQ-TAX-002	User / case-specific tax depreciation treatment	Share of post-policy tax basis expensed immediately in the asset category placed-in-service month; remaining basis follows normal tax life. [LineageRole=ECONOMIC_INPUT]
SECO-VAR-REV-010	ASP Phase-Age Mature Multiplier / ASPPhaseAgeMatureMultiplier_p	Input	Phase	index	USER / Required	>0	Yes	Yes	User Input	SECO-EQ-REV-003	Customer pricing / market ASP / contract or forecast evidence	Governed phase-age ASP multiplier applied from the governed transition month onward; neutral value 1.0 preserves the Base ASP path. [LineageRole=ECONOMIC_INPUT] [SourcePrecedence=Sensitivity > Custom > Named Scenario > Base.]
SECO-VAR-REV-011	ASP Phase-Age Transition Month / ASPPhaseAgeTransitionMonth_p	Input	Phase	months	USER / Required	integer >=0	Yes	Yes	User Input	SECO-EQ-REV-003	Customer pricing / market ASP / contract or forecast evidence	Governed integer phase age, measured in model months from HVM, at which REV-010 begins to apply; 0 applies the mature multiplier from HVM onward. [LineageRole=ECONOMIC_INPUT] [SourcePrecedence=Sensitivity > Custom > Named Scenario > Base.]