SECO

Master Equation Dictionary

115 governed equations — canonical definitions and v1.4.0 physical ownership

v1.4.0 | Final Release | 14 October 2026

Authority	As-built against SECO Generic Base Model v1.4.0 Released Output and Interpretation Finalized
Governed architecture	25 sheets • 115 equations • 215 atomic variables • 30 formula families • 62 hard tests • P1–P10
Formula baseline	455,849 formula cells; formula digest unchanged from natively passed NR-03 checkpoint
Release status	Documentation reconciled; final native reconfirmation after NR-04–NR-09 byte changes remains NR-11

1. Scope and status

Final Release equation status
All 115 governed equation IDs remain in the SECO namespace. Current as-built targets and formula families are preserved. Hard-test coverage is reconciled mechanically to 30_Validation rows 20:81; 16 stale pre-build test annotations are superseded. Every equation has at least one current hard-test mapping and at least one formula cell in its current target.

2. Equation counts by domain

Domain	Count
ACC	4
AUD	5
BRG	12
CAP	13
CEX	7
DCF	10
LFC	7
OPE	8
POL	13
REV	5
RSC	6
SCN	4
TAX	11
TIM	10

3. Full 115-equation register

Equation ID	Name	Canonical formula / identity	Grain	As-built target	Family	Produced vars	Consumed vars	Hard tests

Equation ID	Name	Canonical formula / identity	Grain	As-built target	Family	Produced vars	Consumed vars	Hard tests
SECO-EQ-ACC-001	Monthly Straight-Line Accounting Depreciation	AccountingLifeMonths = NormalizeModelMonths(AccountingLife_c); AD_t = min(RemainingAccountingBasis_t, AccountingDepreciableBasis / AccountingLifeMonths)	Asset cohort × Month	18_Investor_DCF!F135:IK234	F21	SECO-VAR-ACC-003	SECO-VAR-ACC-001; SECO-VAR-ACC-002; SECO-VAR-LFC-004	SECO-AUD-ACC-001; SECO-AUD-ACC-002; SECO-AUD-INT-001
SECO-EQ-ACC-002	Accounting Book Value	BookValue_t = AccountingBasis - CumulativeAccountingDepreciation_t	Asset cohort × Month	18_Investor_DCF!F235:IK334	F21	SECO-VAR-ACC-004	SECO-VAR-ACC-003	SECO-AUD-ACC-001; SECO-AUD-ACC-002; SECO-AUD-INT-001
SECO-EQ-ACC-003	EBITDA	EBITDA = Revenue - ManufacturingCashCost	Location × Month	18_Investor_DCF!F335:IK336	F21	SECO-VAR-ACC-005	SECO-VAR-REV-009	SECO-AUD-ACC-001; SECO-AUD-ACC-002; SECO-AUD-INT-001
SECO-EQ-ACC-004	EBIT	EBIT = EBITDA - AccountingDepreciation	Location × Month	18_Investor_DCF!F337:IK338	F21	SECO-VAR-ACC-006	SECO-VAR-ACC-005	SECO-AUD-ACC-001; SECO-AUD-ACC-002; SECO-AUD-INT-001
SECO-EQ-AUD-001	Hard Failure Count	HardFailures = COUNTIF(HardTestStatus,'FAIL')	Model	30_Validation!B112	F19	SECO-VAR-BRG-018; SECO-VAR-GOV-006	SECO-VAR-AUD-001; SECO-VAR-POL-027	SECO-AUD-INT-001
SECO-EQ-AUD-002	Model Ready Status	ModelReady = IF(HardFailures=0,'READY','NOT READY')	Model	30_Validation!B116	F19	SECO-VAR-GOV-005	SECO-VAR-GOV-006	SECO-AUD-INT-001
SECO-EQ-AUD-003	Global A=B Invariance	If all governed A inputs = B inputs, then ΔLRC=ILD_Pre=ILD_Post=0	Model synthetic case	30_Validation!B118:B121	F22	—	—	SECO-AUD-INT-001
SECO-EQ-AUD-004	Monthly-to-Annual Closure	AnnualFlow_y = Σ_{t in y} MonthlyFlow_t	Location × Year × Flow	30_Validation!B142:I164	F22	—	—	SECO-AUD-INT-001
SECO-EQ-AUD-005	DCF Closure	DCFClosureDifference_l,v = DashboardNPV_l,v - Σ_(t in governed forecast month set) FCF_l,v,t × DF_l,t; v ∈ {Pre, Post}	Location × Valuation View	30_Validation!B123:B126	F22	—	—	SECO-AUD-INT-001
SECO-EQ-BRG-001	Component Timing Effect	TimingEffect_k = Q_A,k × Σ_t (w_A,k,t − w_B,k,t) × DF_t	Component × Month	20_Bridge_Resource!G25:G32	F23	SECO-VAR-BRG-001	SECO-VAR-BRG-007; SECO-VAR-BRG-008; SECO-VAR-BRG-009; SECO-VAR-BRG-010; SECO-VAR-BRG-013	SECO-AUD-BRG-001; SECO-AUD-BRG-002; SECO-AUD-BRG-003; SECO-AUD-BRG-004; SECO-AUD-BRG-005; SECO-AUD-BRG-006; SECO-AUD-BRG-007; SECO-AUD-BRG-008; SECO-AUD-BRG-009; SECO-AUD-BRG-010; SECO-AUD-INT-001

Equation ID	Name	Canonical formula / identity	Grain	As-built target	Family	Produced vars	Consumed vars	Hard tests
SECO-EQ-BRG-002	Component Amount Effect	AmountEffect_k = (Q_A,k − Q_B,k) × Σ_t w_B,k,t × DF_t	Component × Month	20_Bridge_Resource!H25:H32	F23	SECO-VAR-BRG-002	—	SECO-AUD-BRG-001; SECO-AUD-BRG-002; SECO-AUD-BRG-003; SECO-AUD-BRG-004; SECO-AUD-BRG-005; SECO-AUD-BRG-006; SECO-AUD-BRG-007; SECO-AUD-BRG-008; SECO-AUD-BRG-009; SECO-AUD-BRG-010; SECO-AUD-INT-001
SECO-EQ-BRG-003	Component Gap	Gap_k = TimingEffect_k + AmountEffect_k = PV_A,k − PV_B,k	Component	20_Bridge_Resource!I25:I32	F23	SECO-VAR-BRG-003	—	SECO-AUD-BRG-001; SECO-AUD-BRG-002; SECO-AUD-BRG-003; SECO-AUD-BRG-004; SECO-AUD-BRG-005; SECO-AUD-BRG-006; SECO-AUD-BRG-007; SECO-AUD-BRG-008; SECO-AUD-BRG-009; SECO-AUD-BRG-010; SECO-AUD-INT-001
SECO-EQ-BRG-004	Resource Bridge Residual	ResourceBridgeResidual = ΔLRC − Σ_k Gap_k	Comparison	20_Bridge_Resource!B37:B38	F23	SECO-VAR-BRG-004	—	SECO-AUD-BRG-001; SECO-AUD-BRG-002; SECO-AUD-BRG-003; SECO-AUD-BRG-004; SECO-AUD-BRG-005; SECO-AUD-BRG-006; SECO-AUD-BRG-007; SECO-AUD-BRG-008; SECO-AUD-BRG-009; SECO-AUD-BRG-010; SECO-AUD-INT-001

Equation ID	Name	Canonical formula / identity	Grain	As-built target	Family	Produced vars	Consumed vars	Hard tests
SECO-EQ-BRG-005	Investor Pre-Policy Bridge	ILD_Pre = Σ_k NormalizedPreContribution_k + InvestorBridgeResidual_Pre	Comparison	21_Bridge_Investor_Pre!B35:B38	F23	SECO-VAR-BRG-005	SECO-VAR-BRG-011	SECO-AUD-BRG-001; SECO-AUD-BRG-002; SECO-AUD-BRG-003; SECO-AUD-BRG-004; SECO-AUD-BRG-005; SECO-AUD-BRG-006; SECO-AUD-BRG-007; SECO-AUD-BRG-008; SECO-AUD-BRG-009; SECO-AUD-BRG-010; SECO-AUD-INT-001
SECO-EQ-BRG-006	Investor Post-Policy Bridge	ILD_Post = ILD_Pre + PolicyDifferential + PolicyTaxInteractionDifferential + AvoidedPrivateCostDifferential + InvestorBridgeResidual_Post	Comparison	22_Bridge_Investor_Post!B20:B23	F23	SECO-VAR-BRG-006	SECO-VAR-BRG-015; SECO-VAR-BRG-016; SECO-VAR-BRG-017	SECO-AUD-BRG-001; SECO-AUD-BRG-002; SECO-AUD-BRG-003; SECO-AUD-BRG-004; SECO-AUD-BRG-005; SECO-AUD-BRG-006; SECO-AUD-BRG-007; SECO-AUD-BRG-008; SECO-AUD-BRG-009; SECO-AUD-BRG-010; SECO-AUD-INT-001
SECO-EQ-BRG-007	Component PV Control	PV_l,k = Σ_t Stream_l,k,t × DF_view,t	Location × Component × Month	20_Bridge_Resource!D5:D20; 21_Bridge_Investor_Pre!C5:C20; 22_Bridge_Investor_Post!F5:IK12	F23	SECO-VAR-BRG-007; SECO-VAR-BRG-008	—	SECO-AUD-BRG-001; SECO-AUD-BRG-002; SECO-AUD-BRG-003; SECO-AUD-BRG-004; SECO-AUD-BRG-005; SECO-AUD-BRG-006; SECO-AUD-BRG-007; SECO-AUD-BRG-008; SECO-AUD-BRG-009; SECO-AUD-BRG-010; SECO-AUD-INT-001

Equation ID	Name	Canonical formula / identity	Grain	As-built target	Family	Produced vars	Consumed vars	Hard tests
SECO-EQ-BRG-008	Amount and Timing Controls	Q_l,k = Σ_t Stream_l,k,t; w_l,k,t = Stream_l,k,t/Q_l,k when Q_l,k != 0; when Q_l,k = 0, timing weights are governed N/M/zero-weight state	Location × Component × Month	20_Bridge_Resource!C5:F20	F23	SECO-VAR-BRG-009; SECO-VAR-BRG-010	—	SECO-AUD-BRG-001; SECO-AUD-BRG-002; SECO-AUD-BRG-003; SECO-AUD-BRG-004; SECO-AUD-BRG-005; SECO-AUD-BRG-006; SECO-AUD-BRG-007; SECO-AUD-BRG-008; SECO-AUD-BRG-009; SECO-AUD-BRG-010; SECO-AUD-INT-001
SECO-EQ-BRG-009	Normalized Direct Contribution	DirectContribution_k = s_k × (PV_A,k − PV_B,k), where s_k normalizes positive = A disadvantage	Component	21_Bridge_Investor_Pre!E25:E32	F23	SECO-VAR-BRG-011	SECO-VAR-BRG-014	SECO-AUD-BRG-001; SECO-AUD-BRG-002; SECO-AUD-BRG-003; SECO-AUD-BRG-004; SECO-AUD-BRG-005; SECO-AUD-BRG-006; SECO-AUD-BRG-007; SECO-AUD-BRG-008; SECO-AUD-BRG-009; SECO-AUD-BRG-010; SECO-AUD-INT-001
SECO-EQ-BRG-010	Policy Differential	PolicyDifferential = PV(PolicyCash_B) − PV(PolicyCash_A)	Comparison	22_Bridge_Investor_Post!B15	F23	SECO-VAR-BRG-015	—	SECO-AUD-BRG-001; SECO-AUD-BRG-002; SECO-AUD-BRG-003; SECO-AUD-BRG-004; SECO-AUD-BRG-005; SECO-AUD-BRG-006; SECO-AUD-BRG-007; SECO-AUD-BRG-008; SECO-AUD-BRG-009; SECO-AUD-BRG-010; SECO-AUD-INT-001

Equation ID	Name	Canonical formula / identity	Grain	As-built target	Family	Produced vars	Consumed vars	Hard tests
SECO-EQ-BRG-011	Policy-Tax Interaction Differential	PolicyTaxInteractionDifferential = [PV(TaxPost_A−TaxPre_A)] − [PV(TaxPost_B−TaxPre_B)]	Comparison	22_Bridge_Investor_Post!B16	F23	SECO-VAR-BRG-016	—	SECO-AUD-BRG-001; SECO-AUD-BRG-002; SECO-AUD-BRG-003; SECO-AUD-BRG-004; SECO-AUD-BRG-005; SECO-AUD-BRG-006; SECO-AUD-BRG-007; SECO-AUD-BRG-008; SECO-AUD-BRG-009; SECO-AUD-BRG-010; SECO-AUD-INT-001
SECO-EQ-BRG-012	Avoided Private Cost Differential	AvoidedPrivateCostDifferential = PV(AvoidedPrivateCost_B) − PV(AvoidedPrivateCost_A)	Comparison	22_Bridge_Investor_Post!B17	F23	SECO-VAR-BRG-017	SECO-VAR-POL-030	SECO-AUD-BRG-001; SECO-AUD-BRG-002; SECO-AUD-BRG-003; SECO-AUD-BRG-004; SECO-AUD-BRG-005; SECO-AUD-BRG-006; SECO-AUD-BRG-007; SECO-AUD-BRG-008; SECO-AUD-BRG-009; SECO-AUD-BRG-010; SECO-AUD-INT-001
SECO-EQ-CAP-001	Installed Capacity Available at HVM	ICA_HVM_l,p = IC_l,p × AF_HVM_l,p	Location × Phase	11_Capacity_Production!S10:S29	F9	—	SECO-VAR-CAP-001; SECO-VAR-CAP-002; SECO-VAR-TIM-002	SECO-AUD-CAP-001; SECO-AUD-CAP-002; SECO-AUD-CAP-003; SECO-AUD-CAP-004; SECO-AUD-CAP-005; SECO-AUD-CAP-006; SECO-AUD-INT-001
SECO-EQ-CAP-002	Capacity Availability Fraction	AF_l,p,t = if AvailabilityRamp_l,p = 0 then 1 for d_t >= HVM_l,p; else min(1, AF_HVM + max(0,MI(HVM,d_t))/AvailabilityRamp_l,p × (1-AF_HVM))	Location × Phase × Month	11_Capacity_Production!F35:IK54	F9	SECO-VAR-CAP-004	SECO-VAR-CAP-002; SECO-VAR-CAP-003	SECO-AUD-CAP-001; SECO-AUD-CAP-002; SECO-AUD-CAP-003; SECO-AUD-CAP-004; SECO-AUD-CAP-005; SECO-AUD-CAP-006; SECO-AUD-INT-001

Equation ID	Name	Canonical formula / identity	Grain	As-built target	Family	Produced vars	Consumed vars	Hard tests
SECO-EQ-CAP-003	Installed Capacity Available	ICA_l,p,t = IC_l,p × AF_l,p,t	Location × Phase × Month	11_Capacity_Production!F55:IK74	F9	SECO-VAR-CAP-005	SECO-VAR-CAP-001; SECO-VAR-CAP-004	SECO-AUD-CAP-001; SECO-AUD-CAP-002; SECO-AUD-CAP-003; SECO-AUD-CAP-004; SECO-AUD-CAP-005; SECO-AUD-CAP-006; SECO-AUD-INT-001
SECO-EQ-CAP-004	Capacity Efficiency Path	CE_l,p,t = if CERampMonths_l,p = 0 then CE_SS for d_t >= HVM_l,p; else CE_HVM + min(1,max(0,MI(HVM,d_t))/CERampMonths_l,p) × (CE_SS-CE_HVM)	Location × Phase × Month	11_Capacity_Production!F75:IK94	F9	SECO-VAR-CAP-009	SECO-VAR-CAP-006; SECO-VAR-CAP-007; SECO-VAR-CAP-008	SECO-AUD-CAP-001; SECO-AUD-CAP-002; SECO-AUD-CAP-003; SECO-AUD-CAP-004; SECO-AUD-CAP-005; SECO-AUD-CAP-006; SECO-AUD-INT-001
SECO-EQ-CAP-005	Effective Capacity	EC_l,p,t = ICA_l,p,t × CE_l,p,t	Location × Phase × Month	11_Capacity_Production!F95:IK114	F9	SECO-VAR-CAP-010	SECO-VAR-CAP-005; SECO-VAR-CAP-009	SECO-AUD-CAP-001; SECO-AUD-CAP-002; SECO-AUD-CAP-003; SECO-AUD-CAP-004; SECO-AUD-CAP-005; SECO-AUD-CAP-006; SECO-AUD-INT-001
SECO-EQ-CAP-006	Utilization Path	U_l,p,t = if URampMonths_l,p = 0 then U_SS for d_t >= HVM_l,p; else U_HVM + min(1,max(0,MI(HVM,d_t))/URampMonths_l,p) × (U_SS-U_HVM)	Location × Phase × Month	11_Capacity_Production!F115:IK134	F9	SECO-VAR-CAP-014	SECO-VAR-CAP-011; SECO-VAR-CAP-012; SECO-VAR-CAP-013	SECO-AUD-CAP-001; SECO-AUD-CAP-002; SECO-AUD-CAP-003; SECO-AUD-CAP-004; SECO-AUD-CAP-005; SECO-AUD-CAP-006; SECO-AUD-INT-001
SECO-EQ-CAP-007	Wafer Starts	WS_l,p,t = EC_l,p,t × U_l,p,t	Location × Phase × Month	11_Capacity_Production!F135:IK154	F9	SECO-VAR-CAP-015	SECO-VAR-CAP-010; SECO-VAR-CAP-014	SECO-AUD-CAP-001; SECO-AUD-CAP-002; SECO-AUD-CAP-003; SECO-AUD-CAP-004; SECO-AUD-CAP-005; SECO-AUD-CAP-006; SECO-AUD-INT-001

Equation ID	Name	Canonical formula / identity	Grain	As-built target	Family	Produced vars	Consumed vars	Hard tests
SECO-EQ-CAP-008	Wafer Completions	WC_l,p,t = WS_l,p,(t−CT_l,p). In v1.0, nonzero OpeningWIP is permitted only when represented by governed pre-horizon wafer-start history sufficient to generate the corresponding lagged completions; otherwise OpeningWIP_l,p must equal 0.	Location × Phase × Month	11_Capacity_Production!F155:IK174	F10	SECO-VAR-CAP-017	SECO-VAR-CAP-015; SECO-VAR-CAP-016	SECO-AUD-CAP-001; SECO-AUD-CAP-002; SECO-AUD-CAP-003; SECO-AUD-CAP-004; SECO-AUD-CAP-005; SECO-AUD-CAP-006; SECO-AUD-INT-001
SECO-EQ-CAP-009	WIP Roll-Forward	WIP_End_t = WIP_Begin_t + WS_t - WC_t	Location × Phase × Month	11_Capacity_Production!F195:IK214	F9	SECO-VAR-CAP-018	SECO-VAR-CAP-017; SECO-VAR-CAP-025	SECO-AUD-CAP-001; SECO-AUD-CAP-002; SECO-AUD-CAP-003; SECO-AUD-CAP-004; SECO-AUD-CAP-005; SECO-AUD-CAP-006; SECO-AUD-INT-001
SECO-EQ-CAP-010	WIP Conservation	OpeningWIP + ΣWS = ΣWC + EndingWIP	Location × Phase × Horizon	11_Capacity_Production!A255:Y274	F10	—	SECO-VAR-CAP-018	SECO-AUD-CAP-001; SECO-AUD-CAP-002; SECO-AUD-CAP-003; SECO-AUD-CAP-004; SECO-AUD-CAP-005; SECO-AUD-CAP-006; SECO-AUD-INT-001
SECO-EQ-CAP-011	Economic Yield Index Path	EYI_l,p,t = if EYIRampMonths_l,p = 0 then EYI_SS for d_t >= HVM_l,p; else EYI_HVM + min(1,max(0,MI(HVM,d_t))/EYIRampMonths_l,p) × (EYI_SS-EYI_HVM)	Location × Phase × Month	11_Capacity_Production!F215:IK234	F9	SECO-VAR-CAP-022	SECO-VAR-CAP-019; SECO-VAR-CAP-020; SECO-VAR-CAP-021	SECO-AUD-CAP-001; SECO-AUD-CAP-002; SECO-AUD-CAP-003; SECO-AUD-CAP-004; SECO-AUD-CAP-005; SECO-AUD-CAP-006; SECO-AUD-INT-001
SECO-EQ-CAP-012	Economic Output	EO_l,p,t = WC_l,p,t × EYI_l,p,t	Location × Phase × Month	11_Capacity_Production!F235:IK254	F9	SECO-VAR-CAP-023	SECO-VAR-CAP-017; SECO-VAR-CAP-022	SECO-AUD-CAP-001; SECO-AUD-CAP-002; SECO-AUD-CAP-003; SECO-AUD-CAP-004; SECO-AUD-CAP-005; SECO-AUD-CAP-006; SECO-AUD-INT-001

Equation ID	Name	Canonical formula / identity	Grain	As-built target	Family	Produced vars	Consumed vars	Hard tests
SECO-EQ-CAP-013	Opening WIP Initialization	WIP_Begin_(t0) = OpeningWIP_l,p; WIP_Begin_t = WIP_End_(t−1) thereafter	Location × Phase × Month	11_Capacity_Production!F175:IK194	F9	SECO-VAR-CAP-025	SECO-VAR-CAP-024	SECO-AUD-CAP-001; SECO-AUD-CAP-002; SECO-AUD-CAP-003; SECO-AUD-CAP-004; SECO-AUD-CAP-005; SECO-AUD-CAP-006; SECO-AUD-INT-001
SECO-EQ-CEX-001	Physical Fab CapEx	PhysicalFabCapEx = Building + ProcessInfrastructure + Equipment + CampusSharedInfrastructure	Location × Phase	14_Capital_Lifecycle!IL5:IL24	F12	SECO-VAR-CEX-010	SECO-VAR-CEX-001; SECO-VAR-CEX-002; SECO-VAR-CEX-003; SECO-VAR-CEX-004	SECO-AUD-CEX-001; SECO-AUD-CEX-002; SECO-AUD-CEX-003; SECO-AUD-CEX-004; SECO-AUD-INT-001
SECO-EQ-CEX-002	Investor Initial Capital	InvestorInitialCapital = PhysicalFabCapEx + PrivateSoftCost + LandCashOutflow	Location × Phase	14_Capital_Lifecycle!IL25:IL44	F12	SECO-VAR-CEX-011	SECO-VAR-CEX-005; SECO-VAR-CEX-007; SECO-VAR-CEX-010	SECO-AUD-CEX-001; SECO-AUD-CEX-002; SECO-AUD-CEX-003; SECO-AUD-CEX-004; SECO-AUD-INT-001
SECO-EQ-CEX-003	Initial Resource Capital	InitialResourceCapital = PhysicalFabCapEx + PrivateSoftResource + LandOpportunityCost + PublicEnablingResources	Location × Phase	14_Capital_Lifecycle!IL45:IL64	F12	SECO-VAR-CEX-012	SECO-VAR-CEX-006; SECO-VAR-CEX-008; SECO-VAR-CEX-009	SECO-AUD-CEX-001; SECO-AUD-CEX-002; SECO-AUD-CEX-003; SECO-AUD-CEX-004; SECO-AUD-INT-001
SECO-EQ-CEX-004	Monthly Component Spend Share	SpendShare_c,t = Curve(c,t) / Σ_t Curve(c,t), only when Σ_t Curve(c,t) > 0 for an active component	Location × Phase × Component × Month	14_Capital_Lifecycle!F5:IK84	F8	SECO-VAR-CEX-014	SECO-VAR-CEX-001; SECO-VAR-CEX-002; SECO-VAR-CEX-003; SECO-VAR-CEX-004; SECO-VAR-CEX-013	SECO-AUD-CEX-001; SECO-AUD-CEX-002; SECO-AUD-CEX-003; SECO-AUD-CEX-004; SECO-AUD-INT-001
SECO-EQ-CEX-005	Monthly Component CapEx	CapEx_l,p,c,t = ControlTotal_l,p,c × SpendShare_l,p,c,t	Location × Phase × Component × Month	14_Capital_Lifecycle!F85:IK164	F12	SECO-VAR-CEX-015	SECO-VAR-CEX-014	SECO-AUD-CEX-001; SECO-AUD-CEX-002; SECO-AUD-CEX-003; SECO-AUD-CEX-004; SECO-AUD-INT-001

Equation ID	Name	Canonical formula / identity	Grain	As-built target	Family	Produced vars	Consumed vars	Hard tests
SECO-EQ-CEX-006	CapEx Spend Closure	Σ_t CapEx_l,p,c,t = ControlTotal_l,p,c	Location × Phase × Component	14_Capital_Lifecycle!IM85:IM164	F12	—	SECO-VAR-CEX-015	SECO-AUD-CEX-001; SECO-AUD-CEX-002; SECO-AUD-CEX-003; SECO-AUD-CEX-004; SECO-AUD-INT-001
SECO-EQ-CEX-007	First Material Private Cash Outflow	FMPCO_l,p = min{d_t : CumPrivateCapital_t >= MaterialityThreshold}; if the threshold is never reached in the governed horizon, FMPCO = N/M and readiness follows the governed state rule	Location × Phase	14_Capital_Lifecycle!IL65:IL84	F12	SECO-VAR-CEX-017	SECO-VAR-CEX-016	SECO-AUD-CEX-001; SECO-AUD-CEX-002; SECO-AUD-CEX-003; SECO-AUD-CEX-004; SECO-AUD-INT-001
SECO-EQ-DCF-001	Pre-Policy Free Cash Flow	FCF_Pre_l,t = Revenue_l,t − MfgCashCost_l,t − [Σ_(p,c) CapEx_l,p,c,t − AvoidedPrivateCost_l,t] − ReplacementCapEx_l,t − TechnologyRefreshCapEx_l,t − DeltaNWC_l,t − CashTax_Pre_l,t + ResidualCash_l,t	Location × Month	18_Investor_DCF!F11:IK12	F16	SECO-VAR-DCF-005	SECO-VAR-CEX-011; SECO-VAR-CEX-015; SECO-VAR-DCF-004; SECO-VAR-LFC-008; SECO-VAR-LFC-009; SECO-VAR-LFC-015; SECO-VAR-OPE-021; SECO-VAR-REV-008; SECO-VAR-REV-009; SECO-VAR-TAX-012	SECO-AUD-DCF-001; SECO-AUD-INT-001
SECO-EQ-DCF-002	Post-Policy Free Cash Flow	FCF_Post_l,t = Revenue_l,t − MfgCashCost_l,t − [Σ_(p,c) CapEx_l,p,c,t − AvoidedPrivateCost_l,t] − ReplacementCapEx_l,t − TechnologyRefreshCapEx_l,t − DeltaNWC_l,t − CashTax_Post_l,t + Σ_j PolicyCash_j,t + ResidualCash_l,t	Location × Month	18_Investor_DCF!F14:IK15	F16	SECO-VAR-DCF-006	SECO-VAR-CEX-015; SECO-VAR-LFC-008; SECO-VAR-LFC-009; SECO-VAR-OPE-021; SECO-VAR-POL-018; SECO-VAR-POL-020; SECO-VAR-REV-008; SECO-VAR-TAX-013	SECO-AUD-DCF-001; SECO-AUD-INT-001; SECO-AUD-POL-001
SECO-EQ-DCF-003	Investor Discount Factor	DF_l,t = (1+r_l)^(-(d_t-d_0)/365.25)	Month	18_Investor_DCF!F17:IK17	F7	SECO-VAR-DCF-007	SECO-VAR-DCF-001	SECO-AUD-DCF-001; SECO-AUD-INT-001
SECO-EQ-DCF-004	Pre-Policy NPV	NPV_Pre,l = Σ_(t in governed forecast month set) FCF_Pre,l,t × DF_l,t	Location × Horizon	18_Investor_DCF!B27:B28	F18	SECO-VAR-DCF-008	SECO-VAR-DCF-005; SECO-VAR-DCF-007	SECO-AUD-DCF-001; SECO-AUD-INT-001
SECO-EQ-DCF-005	Post-Policy NPV	NPV_Post,l = Σ_(t in governed forecast month set) FCF_Post,l,t × DF_l,t	Location × Horizon	18_Investor_DCF!B29:B30	F18	SECO-VAR-DCF-009	SECO-VAR-DCF-006	SECO-AUD-DCF-001; SECO-AUD-INT-001
SECO-EQ-DCF-006	Investor Location Disadvantage Pre	ILD_Pre = NPV_Pre,B - NPV_Pre,A	Comparison	18_Investor_DCF!B31	F30	SECO-VAR-DCF-010	SECO-VAR-DCF-008	SECO-AUD-DCF-001; SECO-AUD-INT-001
SECO-EQ-DCF-007	Investor Location Disadvantage Post	ILD_Post = NPV_Post,B - NPV_Post,A	Comparison	18_Investor_DCF!B32	F30	SECO-VAR-DCF-011	SECO-VAR-DCF-009	SECO-AUD-DCF-001; SECO-AUD-INT-001
SECO-EQ-DCF-010	Working Capital Mode Gate	NWC_t = 0 if WorkingCapitalMode=OFF; else NWCPercent × Revenue_t	Location × Month	18_Investor_DCF!F5:IK6	F15	SECO-VAR-DCF-003	SECO-VAR-DCF-002; SECO-VAR-DCF-012; SECO-VAR-REV-008	SECO-AUD-DCF-001; SECO-AUD-INT-001
SECO-EQ-DCF-011	Working Capital Change Gate	ΔNWC_t = 0 if WorkingCapitalMode=OFF; else NWC_t - NWC_(t-1), with NWC_(t0-1)=0 in v1.0	Location × Month	18_Investor_DCF!F8:IK9	F15	SECO-VAR-DCF-004	SECO-VAR-DCF-003	SECO-AUD-DCF-001; SECO-AUD-INT-001

Equation ID	Name	Canonical formula / identity	Grain	As-built target	Family	Produced vars	Consumed vars	Hard tests
SECO-EQ-DCF-012	Investor Initial-Capital DCF Adjustment Rule	Within DCF-001/002, gross dated investor initial-capital outflow Σ_(p,c) CapEx_l,p,c,t is consumed as [Σ_(p,c) CapEx_l,p,c,t − AvoidedPrivateCost_l,t].	Location × Month	18_Investor_DCF!F11:IK15 (in-formula initial-capital adjustment)	F16	—	SECO-VAR-POL-030	SECO-AUD-DCF-001; SECO-AUD-INT-001
SECO-EQ-LFC-001	Replacement Control Amount	ReplacementAmount_l,p,c,k = ReplacementAssetBase_l,p,c,k × ReplacementFraction_l,p,c	Location × Phase × Asset × Cohort	14_Capital_Lifecycle!F165:IK244 (virtual cohort amount)	F24	SECO-VAR-LFC-006	SECO-VAR-LFC-002; SECO-VAR-LFC-005	SECO-AUD-INT-001; SECO-AUD-LFC-001; SECO-AUD-LFC-002; SECO-AUD-LFC-003
SECO-EQ-LFC-002	Replacement Date	EconomicLifeMonths = NormalizeModelMonths(EconomicLife_c); ReplacementDate_c,k = ShiftMonths(PlacedInServiceDate_c,k, EconomicLifeMonths)	Asset cohort	14_Capital_Lifecycle!F165:IK244 (virtual cohort date)	F24	SECO-VAR-LFC-007	SECO-VAR-LFC-001; SECO-VAR-LFC-004	SECO-AUD-INT-001; SECO-AUD-LFC-001; SECO-AUD-LFC-002; SECO-AUD-LFC-003
SECO-EQ-LFC-003	Replacement Window Spend	ReplacementCapEx_t = ReplacementAmount × ReplacementWindowShare_t	Asset cohort × Month	14_Capital_Lifecycle!F165:IK244	F24	SECO-VAR-LFC-008	SECO-VAR-LFC-003; SECO-VAR-LFC-006; SECO-VAR-LFC-007	SECO-AUD-INT-001; SECO-AUD-LFC-001; SECO-AUD-LFC-002; SECO-AUD-LFC-003
SECO-EQ-LFC-004	Lifecycle Capital	LifecycleCapital = InitialInvestorCapital + ΣSustainingCapEx + ΣTechnologyRefreshCapEx	Location × Phase × Horizon	14_Capital_Lifecycle!IL85:IL104	F24	—	SECO-VAR-LFC-008; SECO-VAR-LFC-009	SECO-AUD-INT-001; SECO-AUD-LFC-001; SECO-AUD-LFC-002; SECO-AUD-LFC-003
SECO-EQ-LFC-005	Retirement Capacity	RetirementGate_l,p,t = 1 if retirement is inactive or d_t < RetirementDate_l,p, else 0; ICA_l,p,t = ICA_PreRetirement_l,p,t × RetirementGate_l,p,t, where ICA_PreRetirement is the internal CAP-003 stage and is not a new atomic variable.	Location × Phase × Month	14_Capital_Lifecycle!F245:IK264	F24	—	SECO-VAR-CAP-005; SECO-VAR-LFC-011	SECO-AUD-INT-001; SECO-AUD-LFC-001; SECO-AUD-LFC-002; SECO-AUD-LFC-003
SECO-EQ-LFC-006	Residual Cash Flow	ResidualCF_l,p,t = UserResidualValue_l,p only at the governed terminal date T when T is inside the forecast horizon; 0 otherwise	Location × Phase × Horizon	14_Capital_Lifecycle!F267:IK286	F24	—	SECO-VAR-LFC-010	SECO-AUD-INT-001; SECO-AUD-LFC-001; SECO-AUD-LFC-002; SECO-AUD-LFC-003
SECO-EQ-LFC-007	Decommissioning Investor Cash	DecommissioningCash_t = 0 if DecommissioningMode=OFF; else explicit dated decommissioning cash schedule	Location × Month	14_Capital_Lifecycle!F265:IK266	F24	SECO-VAR-LFC-015	SECO-VAR-LFC-012; SECO-VAR-LFC-013	SECO-AUD-INT-001; SECO-AUD-LFC-001; SECO-AUD-LFC-002; SECO-AUD-LFC-003
SECO-EQ-OPE-001	Labor Cost	LaborCost_l,p,t = Headcount_l,p,t × FullyLoadedCostPerEmployee_l,p,t / 12 + VariableLabor_l,p,t	Location × Phase × Month	13_OpEx!F5:IK24	F25	SECO-VAR-OPE-015	SECO-VAR-OPE-001; SECO-VAR-OPE-002; SECO-VAR-OPE-003; SECO-VAR-OPE-004; SECO-VAR-OPE-005; SECO-VAR-OPE-006; SECO-VAR-OPE-007; SECO-VAR-OPE-008; SECO-VAR-OPE-009; SECO-VAR-OPE-010; SECO-VAR-OPE-011; SECO-VAR-OPE-012; SECO-VAR-OPE-013; SECO-VAR-OPE-014	SECO-AUD-INT-001; SECO-AUD-OPE-001; SECO-AUD-OPE-002; SECO-AUD-OPE-003; SECO-AUD-OPE-004; SECO-AUD-OPE-005

Equation ID	Name	Canonical formula / identity	Grain	As-built target	Family	Produced vars	Consumed vars	Hard tests
SECO-EQ-OPE-002	Materials Cost	Materials_l,p,t = WS_l,p,t × MaterialCostPerWaferStart_l,p,t	Location × Phase × Month	13_OpEx!F30:IK49	F25	SECO-VAR-OPE-016	SECO-VAR-CAP-015	SECO-AUD-INT-001; SECO-AUD-OPE-001; SECO-AUD-OPE-002; SECO-AUD-OPE-003; SECO-AUD-OPE-004; SECO-AUD-OPE-005
SECO-EQ-OPE-003	Electricity Cost	ElectricityCost = (FixedLoad_kWh + VariableKWhPerStart × WS) × ElectricityPrice	Location × Phase × Month	13_OpEx!F55:IK74	F25	SECO-VAR-OPE-017	—	SECO-AUD-INT-001; SECO-AUD-OPE-001; SECO-AUD-OPE-002; SECO-AUD-OPE-003; SECO-AUD-OPE-004; SECO-AUD-OPE-005
SECO-EQ-OPE-004	Water Cost	WaterCost = (FixedWaterUse + WaterPerStart × WS) × WaterPrice	Location × Phase × Month	13_OpEx!F80:IK99	F25	SECO-VAR-OPE-018	—	SECO-AUD-INT-001; SECO-AUD-OPE-001; SECO-AUD-OPE-002; SECO-AUD-OPE-003; SECO-AUD-OPE-004; SECO-AUD-OPE-005
SECO-EQ-OPE-005	Maintenance Cost	Maintenance = EquipmentAssetBase × MaintenanceRate/12 + VariableMaintenancePerStart × WS	Location × Phase × Month	13_OpEx!F105:IK124	F25	SECO-VAR-OPE-019	—	SECO-AUD-INT-001; SECO-AUD-OPE-001; SECO-AUD-OPE-002; SECO-AUD-OPE-003; SECO-AUD-OPE-004; SECO-AUD-OPE-005
SECO-EQ-OPE-006	Overhead Cost	Overhead = FixedOverhead/12 + VariableOverheadPerStart × WS	Location × Phase × Month	13_OpEx!F130:IK149	F25	SECO-VAR-OPE-020	SECO-VAR-CAP-015; SECO-VAR-OPE-001; SECO-VAR-OPE-002; SECO-VAR-OPE-003; SECO-VAR-OPE-004; SECO-VAR-OPE-005; SECO-VAR-OPE-006; SECO-VAR-OPE-007; SECO-VAR-OPE-008; SECO-VAR-OPE-009; SECO-VAR-OPE-010; SECO-VAR-OPE-011; SECO-VAR-OPE-012; SECO-VAR-OPE-013; SECO-VAR-OPE-014	SECO-AUD-INT-001; SECO-AUD-OPE-001; SECO-AUD-OPE-002; SECO-AUD-OPE-003; SECO-AUD-OPE-004; SECO-AUD-OPE-005
SECO-EQ-OPE-007	Manufacturing Cash Cost	MfgCashCost = Labor + Materials + Electricity + Water + Maintenance + Overhead	Location × Phase × Month	13_OpEx!F155:IK174	F25	SECO-VAR-OPE-021	SECO-VAR-OPE-015; SECO-VAR-OPE-016; SECO-VAR-OPE-017; SECO-VAR-OPE-018; SECO-VAR-OPE-019; SECO-VAR-OPE-020	SECO-AUD-INT-001; SECO-AUD-OPE-001; SECO-AUD-OPE-002; SECO-AUD-OPE-003; SECO-AUD-OPE-004; SECO-AUD-OPE-005

Equation ID	Name	Canonical formula / identity	Grain	As-built target	Family	Produced vars	Consumed vars	Hard tests
SECO-EQ-OPE-008	Location Cost Ratio	LCR_k,t = Cost_A,k,t / Cost_B,k,t when Cost_B,k,t != 0; governed N/M state when Cost_B,k,t = 0	Cost category × Month	13_OpEx!F180:IK199	F8	SECO-VAR-OPE-022	—	SECO-AUD-INT-001; SECO-AUD-OPE-001; SECO-AUD-OPE-002; SECO-AUD-OPE-003; SECO-AUD-OPE-004; SECO-AUD-OPE-005
SECO-EQ-POL-001	Eligible Basis	EligibleBasis_j = GrossBasis_j × EligibilityFraction_j	Policy instrument × Location × Phase	16_Policy!B5:B84	F26	SECO-VAR-POL-014	SECO-VAR-POL-001; SECO-VAR-POL-002; SECO-VAR-POL-003; SECO-VAR-POL-004; SECO-VAR-POL-005; SECO-VAR-POL-006; SECO-VAR-POL-007; SECO-VAR-POL-008; SECO-VAR-POL-009; SECO-VAR-POL-010; SECO-VAR-POL-011; SECO-VAR-POL-012; SECO-VAR-POL-013	SECO-AUD-INT-001; SECO-AUD-POL-002; SECO-AUD-POL-003; SECO-AUD-POL-004; SECO-AUD-POL-005; SECO-AUD-POL-006
SECO-EQ-POL-002	Policy Eligibility	Eligible_j = Rule_j(QualificationDate_j, EligibilityStart_j, EligibilityEnd_j, Grandfathering_j). For linked §48D presets, the PIS-rate rows require the separate 48D-BOC-GATE eligibility result.	Policy instrument	16_Policy!C5:C84	F26	SECO-VAR-POL-015	—	SECO-AUD-INT-001; SECO-AUD-POL-002; SECO-AUD-POL-003; SECO-AUD-POL-004; SECO-AUD-POL-005; SECO-AUD-POL-006
SECO-EQ-POL-003	Gross Investment Credit	GrossCredit_j = Eligible_j × min(EligibleBasis_j × CreditRate_j, PolicyCap_j)	Policy instrument	16_Policy!D5:D84	F26	SECO-VAR-POL-016	SECO-VAR-POL-014; SECO-VAR-POL-015	SECO-AUD-INT-001; SECO-AUD-POL-002; SECO-AUD-POL-003; SECO-AUD-POL-004; SECO-AUD-POL-005; SECO-AUD-POL-006
SECO-EQ-POL-004	Expected Grant Receipt	ExpectedGrant_j = EligibleGrantAmount_j × ExpectedReceiptFraction_j	Policy instrument	16_Policy!E5:E84	F26	SECO-VAR-POL-017	—	SECO-AUD-INT-001; SECO-AUD-POL-001; SECO-AUD-POL-002; SECO-AUD-POL-003; SECO-AUD-POL-004; SECO-AUD-POL-005; SECO-AUD-POL-006
SECO-EQ-POL-005	Policy Cash Receipt	PolicyCash_j,t = MonetizationSchedule_j(ExpectedBenefit_j, PaymentLag_j, Mode_j)	Policy instrument × Month	16_Policy!F5:IK84	F26	SECO-VAR-POL-018	SECO-VAR-POL-016; SECO-VAR-POL-017	SECO-AUD-INT-001; SECO-AUD-POL-001; SECO-AUD-POL-002; SECO-AUD-POL-003; SECO-AUD-POL-004; SECO-AUD-POL-005; SECO-AUD-POL-006

Equation ID	Name	Canonical formula / identity	Grain	As-built target	Family	Produced vars	Consumed vars	Hard tests
SECO-EQ-POL-006	Government Fiscal Cost	GFC_t = CreditFiscalCost_t + GrantOutlay_t + PublicResourceOutlay_t + OperatingSubsidy_t + TaxExpenditure_t + OtherFiscalCost_t	Location × Month	16_Policy!F90:IK105	F26	SECO-VAR-POL-019	SECO-VAR-CEX-009	SECO-AUD-INT-001; SECO-AUD-POL-001; SECO-AUD-POL-002; SECO-AUD-POL-003; SECO-AUD-POL-004; SECO-AUD-POL-005; SECO-AUD-POL-006
SECO-EQ-POL-007	Investor Policy Support	InvestorPolicySupport_l,t = Σ_j PolicyCash_j,t + (CashTax_Pre_l,t − CashTax_Post_l,t)	Location × Month	16_Policy!F106:IK107	F17	SECO-VAR-POL-020	SECO-VAR-POL-018	SECO-AUD-INT-001; SECO-AUD-POL-002; SECO-AUD-POL-003; SECO-AUD-POL-004; SECO-AUD-POL-005; SECO-AUD-POL-006
SECO-EQ-POL-008	Policy Value to Investor	PolicyValue_l = NPV_Post_l - NPV_Pre_l	Location	16_Policy!B115:B116	F17	SECO-VAR-POL-021	SECO-VAR-DCF-008; SECO-VAR-DCF-009	SECO-AUD-INT-001; SECO-AUD-POL-001; SECO-AUD-POL-002; SECO-AUD-POL-003; SECO-AUD-POL-004; SECO-AUD-POL-005; SECO-AUD-POL-006
SECO-EQ-POL-009	Policy Coverage Ratio	PCR = (PolicyValue_A - PolicyValue_B) / ILD_Pre, if ILD_Pre > 0	Comparison	16_Policy!B118	F8	SECO-VAR-POL-022	SECO-VAR-DCF-010; SECO-VAR-POL-021	SECO-AUD-INT-001; SECO-AUD-POL-002; SECO-AUD-POL-003; SECO-AUD-POL-004; SECO-AUD-POL-005; SECO-AUD-POL-006
SECO-EQ-POL-010	Policy Cash Timing Efficiency	PCTE = PV(InvestorPolicyCash) / NominalInvestorPolicyCash	Location / policy package	16_Policy!C112:C113	F8	SECO-VAR-POL-023	SECO-VAR-POL-001; SECO-VAR-POL-002; SECO-VAR-POL-003; SECO-VAR-POL-004; SECO-VAR-POL-005; SECO-VAR-POL-006; SECO-VAR-POL-007; SECO-VAR-POL-008; SECO-VAR-POL-009; SECO-VAR-POL-010; SECO-VAR-POL-011; SECO-VAR-POL-012; SECO-VAR-POL-013	SECO-AUD-INT-001; SECO-AUD-POL-002; SECO-AUD-POL-003; SECO-AUD-POL-004; SECO-AUD-POL-005; SECO-AUD-POL-006
SECO-EQ-POL-011	Policy Stack Validation	PolicyStackValid = AND(all active policy pairs satisfy CompatibilityGroup and StackingRule)	Policy package	16_Policy!B120	F14	SECO-VAR-POL-026	SECO-VAR-POL-024; SECO-VAR-POL-025	SECO-AUD-INT-001; SECO-AUD-POL-002; SECO-AUD-POL-003; SECO-AUD-POL-004; SECO-AUD-POL-005; SECO-AUD-POL-006

Equation ID	Name	Canonical formula / identity	Grain	As-built target	Family	Produced vars	Consumed vars	Hard tests
SECO-EQ-POL-012	Policy Stack Hard Error	PolicyStackError = 1 if PolicyStackValid=FALSE else 0	Policy package	16_Policy!B121	F14	SECO-VAR-POL-027	SECO-VAR-POL-026	SECO-AUD-INT-001; SECO-AUD-POL-002; SECO-AUD-POL-003; SECO-AUD-POL-004; SECO-AUD-POL-005; SECO-AUD-POL-006
SECO-EQ-POL-013	Avoided Private Cost	AvoidedPrivateCost_t = min(ExplicitAvoidedPrivateCost_t, otherwise-required private substitute_t) when enabled; else 0	Location × Month	16_Policy!F109:IK110	F26	SECO-VAR-POL-030	SECO-VAR-POL-028; SECO-VAR-POL-029	SECO-AUD-INT-001; SECO-AUD-POL-002; SECO-AUD-POL-003; SECO-AUD-POL-004; SECO-AUD-POL-005; SECO-AUD-POL-006
SECO-EQ-REV-001	Recognized Economic Output	REO_l,p,t = EO_l,p,(t−PRL_l,p), where PRL_l,p is an integer number of model months	Location × Phase × Month	12_Revenue!F5:IK24	F11	SECO-VAR-REV-002	SECO-VAR-CAP-023; SECO-VAR-REV-001	SECO-AUD-INT-001; SECO-AUD-REV-001; SECO-AUD-REV-002
SECO-EQ-REV-002	Effective ASP Path	ASP_p,t = ASP_Base_p × ASP_EscalationFactor_p,t	Phase × Month	12_Revenue!F30:IK39	F11	SECO-VAR-REV-005	SECO-VAR-REV-003; SECO-VAR-REV-004	SECO-AUD-INT-001; SECO-AUD-REV-001; SECO-AUD-REV-002
SECO-EQ-REV-003	Location-Adjusted ASP	ASPAdj_l,p,t = ASP_p,t × (1 + LPP_l,p,t)	Location × Phase × Month	12_Revenue!F55:IK74	F11	SECO-VAR-REV-007	SECO-VAR-REV-005; SECO-VAR-REV-006	SECO-AUD-INT-001; SECO-AUD-REV-001; SECO-AUD-REV-002
SECO-EQ-REV-004	Revenue	Revenue_l,p,t = REO_l,p,t × ASPAdj_l,p,t	Location × Phase × Month	12_Revenue!F80:IK99	F11	SECO-VAR-REV-008	SECO-VAR-REV-002; SECO-VAR-REV-007	SECO-AUD-INT-001; SECO-AUD-REV-001; SECO-AUD-REV-002
SECO-EQ-REV-005	Campus Revenue	Revenue_l,t = Σ_p Revenue_l,p,t	Location × Month	12_Revenue!F105:IK106	F11	SECO-VAR-REV-009	SECO-VAR-REV-008	SECO-AUD-INT-001; SECO-AUD-REV-001; SECO-AUD-REV-002
SECO-EQ-RSC-001	Operating Resource Cost	OperatingResourceCost = InvestorOperatingCashCost - TransferPayments + ExternallyFundedOperatingResources	Location × Month	17_Resource_Economics!F13:IK14	F27	SECO-VAR-RSC-002	SECO-VAR-OPE-015; SECO-VAR-OPE-016; SECO-VAR-OPE-017; SECO-VAR-OPE-018; SECO-VAR-OPE-019; SECO-VAR-OPE-020; SECO-VAR-OPE-021	SECO-AUD-INT-001
SECO-EQ-RSC-002	Monthly Resource Cost	ResourceCost_t = PhysicalCapitalResource + PrivateSoftResource + LandOpportunityCost + PublicResources + OperatingResourceCost + SustainingResourceCapital + RefreshResource + Decommissioning	Location × Month	17_Resource_Economics!F22:IK23	F27	SECO-VAR-RSC-003	SECO-VAR-CEX-006; SECO-VAR-CEX-008; SECO-VAR-CEX-009; SECO-VAR-CEX-012; SECO-VAR-CEX-015; SECO-VAR-LFC-008; SECO-VAR-LFC-009; SECO-VAR-LFC-016; SECO-VAR-RSC-002	SECO-AUD-INT-001; SECO-AUD-POL-001
SECO-EQ-RSC-003	Resource Discount Factor	DF_S,t = (1+r_S)^(-(d_t-d_0)/365.25)	Month	17_Resource_Economics!F25:IK25	F7	SECO-VAR-RSC-004	SECO-VAR-RSC-001	SECO-AUD-INT-001

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SECO-EQ-RSC-004	Location Resource Cost	LRC_l = Σ_(t in governed forecast month set) ResourceCost_l,t × DF_S,t	Location × Horizon	17_Resource_Economics!B30:B31	F18	SECO-VAR-RSC-005	SECO-VAR-RSC-003; SECO-VAR-RSC-004	SECO-AUD-INT-001
SECO-EQ-RSC-005	Location Resource Cost Gap	ΔLRC = LRC_A - LRC_B	Comparison	17_Resource_Economics!B33	F18	SECO-VAR-RSC-006	SECO-VAR-RSC-005	SECO-AUD-INT-001
SECO-EQ-RSC-006	Decommissioning Resource Cost	DecommissioningResource_t = 0 if DecommissioningMode=OFF; else explicit dated real-resource schedule	Location × Month	17_Resource_Economics!F19:IK20	F18	SECO-VAR-LFC-016	SECO-VAR-LFC-012; SECO-VAR-LFC-014	SECO-AUD-INT-001
SECO-EQ-SCN-001	Named Scenario Resolution	ScenarioValue_i = DeclaredOverride_i if ActiveScenario matches; else BaseValue_i	Parameter	05_Run_Values!G10:G2374; J10:J2374 (named-scenario branch)	F1	SECO-VAR-SCN-003	SECO-VAR-GOV-001; SECO-VAR-SCN-001; SECO-VAR-SCN-002	SECO-AUD-INT-001; SECO-AUD-SCN-001; SECO-AUD-SCN-002; SECO-AUD-SCN-003
SECO-EQ-SCN-002	Custom Override Resolution	CustomValue_i = CustomOverride_i if CUSTOM active and override exists; else ScenarioValue_i	Parameter	05_Run_Values!H10:H2374; J10:J2374 (custom branch)	F2	SECO-VAR-SCN-005	SECO-VAR-GOV-001; SECO-VAR-SCN-003; SECO-VAR-SCN-004	SECO-AUD-INT-001; SECO-AUD-SCN-001; SECO-AUD-SCN-002; SECO-AUD-SCN-003
SECO-EQ-SCN-003	Sensitivity Run Value	RunValue_i = SensitivityOverride_i if sensitivity active; else CustomValue_i	Parameter	05_Run_Values!I10:J2374 (sensitivity + final RunValue)	F2	SECO-VAR-SCN-007	SECO-VAR-SCN-005; SECO-VAR-SCN-006	SECO-AUD-INT-001; SECO-AUD-SCN-001; SECO-AUD-SCN-002; SECO-AUD-SCN-003
SECO-EQ-SCN-004	Scenario Reset Identity	RunValue_i(BASE after reset) = BaseValue_i	Parameter	04_Run_State!A1:H18; 05_Run_Values!F10:J2374 (reset/restoration invariant)	F2	—	SECO-VAR-SCN-007	SECO-AUD-INT-001; SECO-AUD-SCN-001; SECO-AUD-SCN-002; SECO-AUD-SCN-003
SECO-EQ-TAX-001	Tax Basis after Policy	TaxBasis = GrossEligibleTaxBasis - CreditBasisReduction - GrantBasisReduction	Asset cohort	15_Tax!D5:E164 (gross/post-policy tax basis + life support)	F28	SECO-VAR-TAX-003	SECO-VAR-POL-001; SECO-VAR-POL-002; SECO-VAR-POL-003; SECO-VAR-POL-004; SECO-VAR-POL-005; SECO-VAR-POL-006; SECO-VAR-POL-007; SECO-VAR-POL-008; SECO-VAR-POL-009; SECO-VAR-POL-010; SECO-VAR-POL-011; SECO-VAR-POL-012; SECO-VAR-POL-013; SECO-VAR-POL-016; SECO-VAR-TAX-002	SECO-AUD-INT-001; SECO-AUD-TAX-001; SECO-AUD-TAX-002; SECO-AUD-TAX-003; SECO-AUD-TAX-004; SECO-AUD-TAX-005
SECO-EQ-TAX-002	Monthly Tax Depreciation	TaxLifeMonths = NormalizeModelMonths(TaxLife_c); TD_t = min(RemainingTaxBasis_t, TaxBasis / TaxLifeMonths)	Asset cohort × Month	15_Tax!F5:IK164	F28	SECO-VAR-TAX-005	SECO-VAR-LFC-004; SECO-VAR-TAX-003; SECO-VAR-TAX-004	SECO-AUD-INT-001; SECO-AUD-TAX-001; SECO-AUD-TAX-002; SECO-AUD-TAX-003; SECO-AUD-TAX-004; SECO-AUD-TAX-005

Equation ID	Name	Canonical formula / identity	Grain	As-built target	Family	Produced vars	Consumed vars	Hard tests
SECO-EQ-TAX-003	Pre-Policy Taxable Income	TI_Pre = TaxRevenue - DeductibleOpEx - TaxDepreciation_Pre - OtherDeductions	Location × Month	15_Tax!F170:IK170; F172:IK172	F28	—	SECO-VAR-REV-008; SECO-VAR-TAX-001; SECO-VAR-TAX-005	SECO-AUD-INT-001; SECO-AUD-TAX-001; SECO-AUD-TAX-002; SECO-AUD-TAX-003; SECO-AUD-TAX-004; SECO-AUD-TAX-005
SECO-EQ-TAX-004	Post-Policy Taxable Income	TI_Post = TaxRevenue - DeductibleOpEx - TaxDepreciation_Post - OtherDeductions + TaxableGrantIncome	Location × Month	15_Tax!F171:IK171; F173:IK173	F28	—	SECO-VAR-REV-008	SECO-AUD-INT-001; SECO-AUD-TAX-001; SECO-AUD-TAX-002; SECO-AUD-TAX-003; SECO-AUD-TAX-004; SECO-AUD-TAX-005
SECO-EQ-TAX-005	NOL Generated	NOLGenerated_t = max(0,-TaxableIncome_t)	Location × Month	15_Tax!F180:IK183	F13	SECO-VAR-TAX-009	—	SECO-AUD-INT-001; SECO-AUD-TAX-001; SECO-AUD-TAX-002; SECO-AUD-TAX-003; SECO-AUD-TAX-004; SECO-AUD-TAX-005
SECO-EQ-TAX-006	NOL Used	NOLUsed_t = min(NOLBegin_t, max(0,TaxableIncome_t) × UtilizationLimit), allocated oldest-expiring eligible cohort first; cohorts reaching statutory life at t remain usable during t and only their unused remainder expires at period end.	Location × Month	15_Tax!F185:IK188	F13	SECO-VAR-TAX-010	SECO-VAR-TAX-007; SECO-VAR-TAX-008; SECO-VAR-TAX-011	SECO-AUD-INT-001; SECO-AUD-TAX-001; SECO-AUD-TAX-002; SECO-AUD-TAX-003; SECO-AUD-TAX-004; SECO-AUD-TAX-005
SECO-EQ-TAX-007	NOL Roll-Forward	NOLEnd_t = NOLBegin_t + NOLGenerated_t − NOLUsed_t − NOLExpired_t; NOLBegin_(t+1) = NOLEnd_t	Location × Month	15_Tax!F175:IK178; F195:IK198	F13	SECO-VAR-TAX-008; SECO-VAR-TAX-011	SECO-VAR-TAX-009; SECO-VAR-TAX-010; SECO-VAR-TAX-011; SECO-VAR-TAX-016	SECO-AUD-INT-001; SECO-AUD-TAX-001; SECO-AUD-TAX-002; SECO-AUD-TAX-003; SECO-AUD-TAX-004; SECO-AUD-TAX-005
SECO-EQ-TAX-008	Taxable Income after NOL	TI_AfterNOL_t = max(0, TaxableIncome_t - NOLUsed_t)	Location × Month	15_Tax!F200:IK203	F13	—	—	SECO-AUD-INT-001; SECO-AUD-TAX-001; SECO-AUD-TAX-002; SECO-AUD-TAX-003; SECO-AUD-TAX-004; SECO-AUD-TAX-005

Equation ID	Name	Canonical formula / identity	Grain	As-built target	Family	Produced vars	Consumed vars	Hard tests
SECO-EQ-TAX-009	Pre-Credit Cash Tax	Tax_PreCredit = TI_AfterNOL × CorporateTaxRate	Location × Month	15_Tax!F205:IK208	F13	—	SECO-VAR-TAX-006	SECO-AUD-INT-001; SECO-AUD-TAX-001; SECO-AUD-TAX-002; SECO-AUD-TAX-003; SECO-AUD-TAX-004; SECO-AUD-TAX-005
SECO-EQ-TAX-010	Cash Tax after Credits	CashTax = max(0, Tax_PreCredit - UsableTaxCredits)	Location × Month	15_Tax!F210:IK213	F28	SECO-VAR-TAX-012; SECO-VAR-TAX-013	SECO-VAR-TAX-001	SECO-AUD-INT-001; SECO-AUD-TAX-001; SECO-AUD-TAX-002; SECO-AUD-TAX-003; SECO-AUD-TAX-004; SECO-AUD-TAX-005
SECO-EQ-TAX-011	NOL Cohort Expiration	NOLExpired_t = 0 if NOLExpirationMode=OFF; else Σ remaining unused balance, after NOLUsed_t allocation, of eligible cohorts reaching statutory life at the end of t	Location × Month	15_Tax!F190:IK193	F13	SECO-VAR-TAX-016	SECO-VAR-TAX-014; SECO-VAR-TAX-015	SECO-AUD-INT-001; SECO-AUD-TAX-001; SECO-AUD-TAX-002; SECO-AUD-TAX-003; SECO-AUD-TAX-004; SECO-AUD-TAX-005
SECO-EQ-TIM-001	Signed Month Index	MI(d1,d2)=12[Year(d2)-Year(d1)]+Month(d2)-Month(d1)	Date pair	06_Calendar_Structure!E24:E263; 10_Timing!T10:T29,W10:W29	F29	—	—	SECO-AUD-INT-001; SECO-AUD-TIM-001; SECO-AUD-TIM-002; SECO-AUD-TIM-003; SECO-AUD-TIM-004; SECO-AUD-TIM-005; SECO-AUD-TIM-006
SECO-EQ-TIM-002	Development Lead Time	DLT_l,p = MI(InvestmentDecisionDate, HVM_l,p)	Location × Phase	10_Timing!T10:T29	F29	—	SECO-VAR-GOV-004; SECO-VAR-TIM-002	SECO-AUD-INT-001; SECO-AUD-TIM-001; SECO-AUD-TIM-002; SECO-AUD-TIM-003; SECO-AUD-TIM-004; SECO-AUD-TIM-005; SECO-AUD-TIM-006

Equation ID	Name	Canonical formula / identity	Grain	As-built target	Family	Produced vars	Consumed vars	Hard tests
SECO-EQ-TIM-003	Matched HVM Assignment	HVM_A,p = HVM_B,p = HVM_p^Matched	Phase	10_Timing!O10:O29	F29	SECO-VAR-TIM-002	SECO-VAR-GOV-002; SECO-VAR-TIM-001	SECO-AUD-INT-001; SECO-AUD-TIM-001; SECO-AUD-TIM-002; SECO-AUD-TIM-003; SECO-AUD-TIM-004; SECO-AUD-TIM-005; SECO-AUD-TIM-006
SECO-EQ-TIM-004	Matched Tool Start	ToolStart_l,p = ShiftMonths(HVM_p^Matched, -ToolQualificationDuration_l,p)	Location × Phase	10_Timing!P10:P29	F29	SECO-VAR-TIM-009	SECO-VAR-TIM-001; SECO-VAR-TIM-002; SECO-VAR-TIM-006	SECO-AUD-INT-001; SECO-AUD-TIM-001; SECO-AUD-TIM-002; SECO-AUD-TIM-003; SECO-AUD-TIM-004; SECO-AUD-TIM-005; SECO-AUD-TIM-006
SECO-EQ-TIM-005	Matched Construction Start	ConstructionStart_l,p = ShiftMonths(ToolStart_l,p, -ConstructionDuration_l,p)	Location × Phase	10_Timing!Q10:Q29	F29	SECO-VAR-TIM-008	SECO-VAR-TIM-005; SECO-VAR-TIM-009	SECO-AUD-INT-001; SECO-AUD-TIM-001; SECO-AUD-TIM-002; SECO-AUD-TIM-003; SECO-AUD-TIM-004; SECO-AUD-TIM-005; SECO-AUD-TIM-006
SECO-EQ-TIM-006	Matched Preconstruction Start	PreconStart_l,p = ShiftMonths(ConstructionStart_l,p, -(PreconstructionDuration_l,p + SiteControlShock_l,p))	Location × Phase	10_Timing!R10:R29	F29	SECO-VAR-TIM-007	SECO-VAR-TIM-003; SECO-VAR-TIM-004; SECO-VAR-TIM-008	SECO-AUD-INT-001; SECO-AUD-TIM-001; SECO-AUD-TIM-002; SECO-AUD-TIM-003; SECO-AUD-TIM-004; SECO-AUD-TIM-005; SECO-AUD-TIM-006
SECO-EQ-TIM-007	Matched-HVM Feasibility	Feasible_l,p = 1[PreconStart_l,p >= InvestmentDecisionDate]	Location × Phase	10_Timing!S10:S29,X10:X29	F29	SECO-VAR-TIM-010	SECO-VAR-GOV-004; SECO-VAR-TIM-007	SECO-AUD-INT-001; SECO-AUD-TIM-001; SECO-AUD-TIM-002; SECO-AUD-TIM-003; SECO-AUD-TIM-004; SECO-AUD-TIM-005; SECO-AUD-TIM-006

Equation ID	Name	Canonical formula / identity	Grain	As-built target	Family	Produced vars	Consumed vars	Hard tests
SECO-EQ-TIM-008	Natural HVM	HVM_l,p = ShiftMonths(InvestmentDecisionDate_p, PreconstructionDuration_l,p + SiteControlShock_l,p + ConstructionDuration_l,p + ToolQualificationDuration_l,p)	Location × Phase	10_Timing!O10:O29	F29	—	SECO-VAR-GOV-002; SECO-VAR-TIM-002; SECO-VAR-TIM-003; SECO-VAR-TIM-004; SECO-VAR-TIM-005; SECO-VAR-TIM-006	SECO-AUD-INT-001; SECO-AUD-TIM-001; SECO-AUD-TIM-002; SECO-AUD-TIM-003; SECO-AUD-TIM-004; SECO-AUD-TIM-005; SECO-AUD-TIM-006
SECO-EQ-TIM-009	Steady-State Date	SteadyStateDate_l,p = ShiftMonths(HVM_l,p, max(AvailabilityRamp, CERamp, UtilizationRamp, EYIRamp))	Location × Phase	10_Timing!U10:U29	F29	SECO-VAR-TIM-012	SECO-VAR-CAP-003; SECO-VAR-CAP-008; SECO-VAR-CAP-013; SECO-VAR-CAP-021; SECO-VAR-TIM-002	SECO-AUD-INT-001; SECO-AUD-TIM-001; SECO-AUD-TIM-002; SECO-AUD-TIM-003; SECO-AUD-TIM-004; SECO-AUD-TIM-005; SECO-AUD-TIM-006
SECO-EQ-TIM-010	Capital Commitment Lead Time	CCLT_l,p = MI(FirstMaterialPrivateCashOutflow_l,p, HVM_l,p)	Location × Phase	10_Timing!W10:W29	F29	SECO-VAR-TIM-011	SECO-VAR-CEX-017; SECO-VAR-TIM-002	SECO-AUD-INT-001; SECO-AUD-TIM-001; SECO-AUD-TIM-002; SECO-AUD-TIM-003; SECO-AUD-TIM-004; SECO-AUD-TIM-005; SECO-AUD-TIM-006

v1.4.0 equation-architecture addendum

The governed equation count remains 115. v1.4 parameterizes existing policy, tax, revenue and timing equations rather than adding new governed equation IDs. Annual reporting is a presentation aggregation and does not create a new governed equation family.

v1.4 change	Effect on existing equation architecture
POL-031	Existing policy equations consume component-level eligible-CapEx ratios while preserving separate row-level policy eligibility.
TAX-017	Existing tax depreciation equations consume governed bonus/immediate-expensing fraction.
REV-010 / REV-011	Existing revenue equations consume phase-age mature ASP multiplier and transition month.
Timing modes	Existing timing equations resolve MATCHED_HVM and NATURAL_SCHEDULE behavior.
G01-G12	Scenario controller uses existing Scenario/Custom/Sensitivity resolver equations; no new governed equation IDs.