FVI Artificial Support Score – Implementable Formulas Using Available Data

This guide uses your Artificial Support sheet structure and the uploaded CSVs to produce operational formulas for subsidy/mandate support. Where direct subsidy values are missing, I provide consistent proxies and minimal manual inputs.

Datasets detected

• coal-phase-out-timeline.csv — fields: Entity (country), Code (ISO■3), Year, Coal Exit Timeline (Beyond Coal).

• coal-mining_country_emissions_v4_4_0.csv — country/subsector emissions quantities and units (for weighting or coverage).

• coal-mining_emissions_sources_v4_4_0.csv — source list w/ iso3_country, sector/subsector, status_year, activity/emissions.

• coal-mining_emissions_sources_confidence_v4_4_0.csv — confidence metadata (use as data■quality weights).

• coal-mining_emissions_sources_ownership_v4_4_0.csv — ownership/parent relationships (for company■level analysis).

Global conventions

• Choose scoring year (e.g., 2023). For timeline series, use the most recent year ≤ scoring year.

• Keys: Country ISO■3 from Code/iso3_country; for company analyses use parent_entity_id.

• Normalization: 0–100 (higher = more artificial support) with winsorization at 1st/99th percentile.

ARTIFICIAL SUPPORT 1 — Direct Subsidy Dependence (Proxy)

Goal: Capture reliance on explicit fiscal support where direct subsidy $ is missing.

Proxy inputs

• Manual table subsidies_country.csv: Country, Year, Coal_Subsidies_USD (optional if you can fill).

• emissions_country from coal-mining_country_emissions_v4_4_0.csv for weighting.

Formulas (math)

• If Coal_Subsidies_USD available: AS1[c] = 100 × Coal_Subsidies_USD[c]/max_c(Coal_Subsidies_USD).

• Else proxy: AS1[c] = 100 × percentile_rank(Emissions[c]) (assuming higher emissions regimes tend to receive more support absent pricing).

ARTIFICIAL SUPPORT 2 — Mandate/Exit Timeline Support

Goal: Penalize countries lacking coal exit commitments or with very late timelines (i.e., more support to keep coal).

Dataset & fields

• coal-phase-out-timeline.csv → fields: Code (ISO■3), Year, Coal Exit Timeline (categorical/ordinal).

Mapping

• Map timeline categories to years (e.g., ‘No commitment’→2100; ‘2030s’→2035; ‘2040s’→2045).

Formula (math)

• AS2[c] = 100 × (ExitYear[c] − Y_ref) / (2100 − Y_ref), clamped to [0,100].

ARTIFICIAL SUPPORT 3 — Regulatory Shielding (Coverage Gap)

Goal: Higher where coal is insulated from pricing/reporting/standards.

Inputs

• Minimal manual coverage table: coverage_pct[c] (0–100) for carbon pricing/reporting.

Formula (math)

- `AS3[c] = 100 − coverage_pct[c].`

ARTIFICIAL SUPPORT 4 — Ownership/Public Support Exposure

Goal: Public ownership or state■linked entities are more likely to receive support.

Dataset & fields

• coal-mining_emissions_sources_ownership_v4_4_0.csv → fields: parent_entity_type, ownership_share_percent, parent_is_state (binary if derivable).

Formula (math)

- `AS4[c] = 100 × ( Σ state_owned_share[c] / Σ total_owned_share[c] ).`

Composite assembly

• Normalize AS1–AS4 to 0–100. Suggested weights: AS1 35%, AS2 25%, AS3 25%, AS4 15%.

• Country→sector aggregation: weight by emissions_country or installed coal capacity when available.

Implementation tips

• If you can add a subsidy dataset later, drop it into subsidies_country.csv and AS1 will switch from proxy to measured.

• For AS2 mapping, keep a small lookup table from ‘Coal Exit Timeline’ categories→ExitYear. Use latest entry per country ≤ Y_ref.

• Use confidence scores from the ‘confidence’ CSV as weights when summarizing by country to down■weight weak sources.