1) What the columns mean (short, precise)

- **country_iso3** – 3-letter country code.
- **year** – calendar year.
- **NY.GDP.MKTP.CD (GDP)** – GDP, current US$.
- **NY.GDP.COAL.RT.ZS (coal_rent_pct_gdp)** – Coal rents as % of GDP. "Rent" = value of coal output at world prices minus total production costs.
- **coal_rent_usd** – Coal rents in US$:
  `coal_rent_usd = (coal_rent_pct_gdp/100) × GDP`.
- **fossil_fuel_subsidy_usd** – Explicit fossil-fuel subsidy in US$ (currently 0 in the file; plug in SDG 12.c.1/IMF values when available).
- **coal_electricity_share** – % of national electricity generated from coal (0–100).
- **score_direct_subsidy / score_tariff_trade_protection / score_tax_privilege / score_dependency_conflict** – 0–100 scaled scores (one per composite).

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2) Country-year score formulas (how to compute each row)

All scores are clipped to **[0, 100]**.

A) Direct Subsidy Dependence (Score 1)

"How much of coal's economic rent is covered by budget support?"

1. Compute coal rent in US$:
   `coal_rent_usd = (coal_rent_pct_gdp/100) × GDP`.
2. Score:
   `Score1 = min(100, 100 × fossil_fuel_subsidy_usd / coal_rent_usd)`.
   If `coal_rent_usd` ≤ 0 or missing → Score1 = NA. With the current file (subsidy=0),

Score1=0.

B) Tariff & Trade Protection (Score 2, proxy)

“Reliance on coal in the power mix as a protection/advantage proxy.”

`Score2 = coal_electricity_share` (already 0–100).

C) Tax Privilege (Score 3, proxy)

“Potential pre-tax rents that could be under-taxed.”

`Score3 = min(100, 10 × coal_rent_pct_gdp)`.

D) Dependency on Conflict/War (Score 4)

In the supplied file: Score4 = 0 (no global, open conflict-linked series).
If you later add coal growth by year and a conflict flag:

- `g_conf` = average annual growth of `coal_rent_usd` in conflict years.
- `g_peace` = average annual growth in peace years.
- `Score4 = max(0, min(100, 10 × g_conf / (|g_peace| + ε)))`, with small ε (e.g., 0.5%) to avoid divide-by-zero.

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3) Country headline scores (single number per country)

Pick **one** consistent rule:

- **Latest-year** headline: use the most recent non-missing year.
- **5-year average (recommended):** mean of the last 5 available years (ignore missing).

  Optionally weight each year by **coal_rent_usd** so years when coal matters more count more.

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4) Global scores (per year and headline)

Use a coal-importance weighted average so large coal economies matter more.

For a given year *t*:

- Weight wi,tw_{i,t}wi,t = **coal_rent_usd** for country *i*.
  (For Score 2 you may use **total electricity generation** if you have it; otherwise keep coal_rent_usd.)

GlobalScoret=∑iwi,t⋅Scorei,t∑iwi,t\text{GlobalScore}_t=\frac{\sum_i w_{i,t}\cdot \text{Score}_{i,t}}{\sum_i w_{i,t}}GlobalScoret=∑iwi,t∑iwi,t⋅Scorei,t

Global headline = latest year with good coverage, or the mean of the last 5 yearly global scores.
Report **coverage** alongside (number of contributing countries and share of total weight).

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5) Missing-data rules (use these consistently)

- If a score needs a denominator (e.g., `coal_rent_usd`) and it's ≤ 0 or missing → **Score = NA** (exclude from averages).
- Do **not** treat NA as zero when averaging countries; use weights of non-missing rows only.
- Always cap outputs to **[0, 100]**.

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6) Tiny worked example (one row)

Suppose a country in 2021 has:

- GDP = 200 bn US$, coal_rent_pct_gdp = 2% → `coal_rent_usd = 0.02 × 200 bn = 4 bn`
- fossil_fuel_subsidy_usd = 0.5 bn

- coal_electricity_share = 60%

Then:

- **Score1** = min(100, 100 × 0.5 / 4) = **12.5**
- **Score2** = **60**
- **Score3** = min(100, 10 × 2) = **20**
- **Score4** = **0** (unless you compute conflict/peace growth)

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7) What to substitute when better data arrive

- **Score 1:** replace `fossil_fuel_subsidy_usd` with SDG 12.c.1/IMF explicit subsidies → recompute (formula unchanged).
- **Score 2:** if you obtain tariff/NTB indices for coal or electricity imports, rescale those to 0–100 and use them directly (instead of the coal-electricity proxy).
- **Score 3:** if you obtain *effective tax rate vs statutory* for the coal sector, build the score from that gap and keep the 0–100 cap.
- **Score 4:** add conflict and coal-growth series, then use the stated growth-ratio formula.

One-page memory aid (order of operations)

1. Compute `coal_rent_usd`.
2. Score1 = min(100, 100 × subsidy / coal_rent_usd).
3. Score2 = coal_electricity_share.
4. Score3 = min(100, 10 × coal_rent_pct_gdp).
5. Score4 = 0 (or growth-ratio if conflict data exist).

6. Country headline = latest-year or 5-year mean.
7. Global = weight-average by coal_rent_usd (or electricity kWh for Score 2).
8. Cap to [0,100], exclude NA from averages, report coverage.