Price the Capital, Then Test the Budget

Climate investment needs, the cost of capital and public spending in CPAT

The cost of capital, not the size of the bill, decides whether clean capital pays its way. And a project worth building can still break the budget's cash flow.

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Ministries' climate model prices policies, but not the capital they call for

$2.3–2.5tn

a year of climate investment needed by 2030 in developing countries other than China

>2×

cost of capital for utility-scale solar in emerging and developing economies vs advanced ones

Power only

the one sector where CPAT attaches capital to physical change; no split of who pays, no public-money test

CPAT tells a ministry what a carbon price raises and cuts in more than 180 countries. Its power model reports investment; elsewhere a cleaner boiler is only lower fuel use.

Source: IHLEG (2024); IEA (2024), Reducing the Cost of Capital; CPAT documentation (2024); working paper 6.3.

Price the same investment three ways, to separate the price of finance from the value of time

Lens (a), market rate: what investors and households pay, by country and technology.

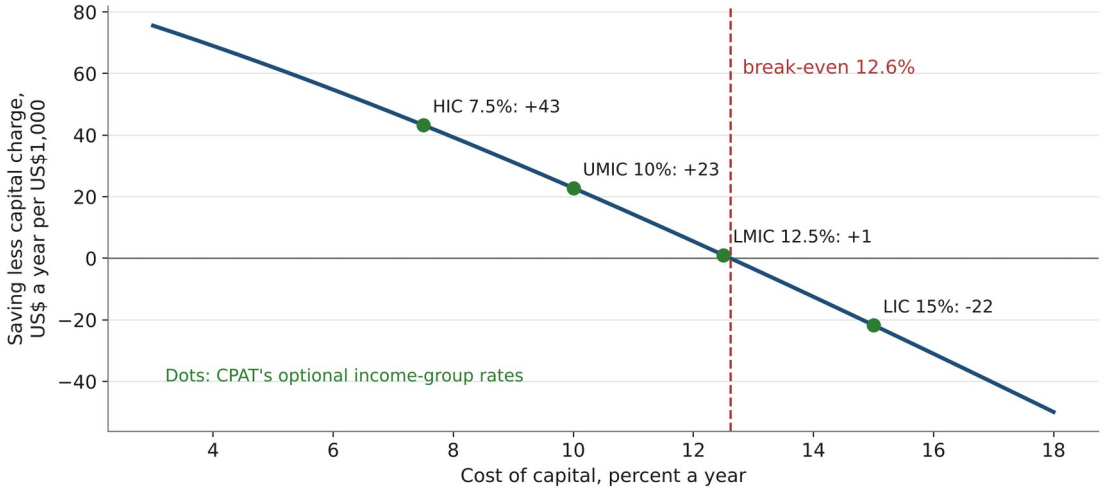
Lens (b), 6 percent: the World Bank's social rate, the value of time.

Lens (c), 6 percent plus co-benefits and carbon: what society gets.

The gap between (a) and (c) is the case for public finance, and what de-risking can buy down.

Source: Working paper 6.3, investment needs; World Bank (2016) discounting note; High-Level Commission on Carbon Prices (2017).

A typical clean asset pays its way at 6 percent and breaks even at 12.6 percent



Saving less capital charge per $1,000 of capital; stylized asset saving $133 a year for 25 years.

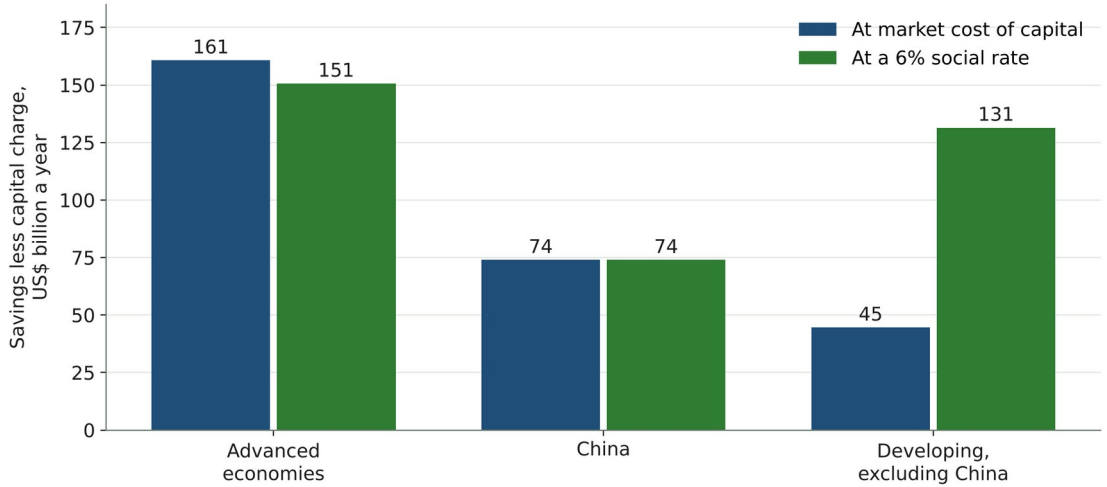
Per $1,000: +$43 a year at 7.5%, +$1 at 12.5%, −$22 at 15%.

CPAT's default is a country rate plus a technology premium (2.9 points for LMIC solar); the income-group rates are an option.

Convention matters: with savings from year zero, as in CPAT, break-even is 14.8%.

Source: Working paper 6.3, Proposition 1; CPAT documentation (2024); CPAT-AI repository, methods/Power.md (2026).

Developing countries barely gain from clean capital at market rates; at 6 percent they gain $131bn a year



Savings less capital charge on one year's 2030 investment, US$ billion a year (stylized savings rate).

Developing, excluding China: $45bn at 10.5%, −$52bn at 15%, $131bn at 6%.

Each point off the cost of capital is worth about $36bn a year per year of $4.8tn clean energy investment.

Close the gap: price carbon and pollution, lend concessionally, guarantee contracts, pool and refinance (Briefs 3.1, 3.2).

Source: Working paper 6.3, Table 1; IHLEG (2024) investment midpoints. An illustration of scale, not an estimate.

Fund a measure when its value per budget dollar beats the cost of raising a dollar of tax

The test: value to people over net cost to the budget (the MVPF) against the cost of public funds, about 1.2 in Africa.

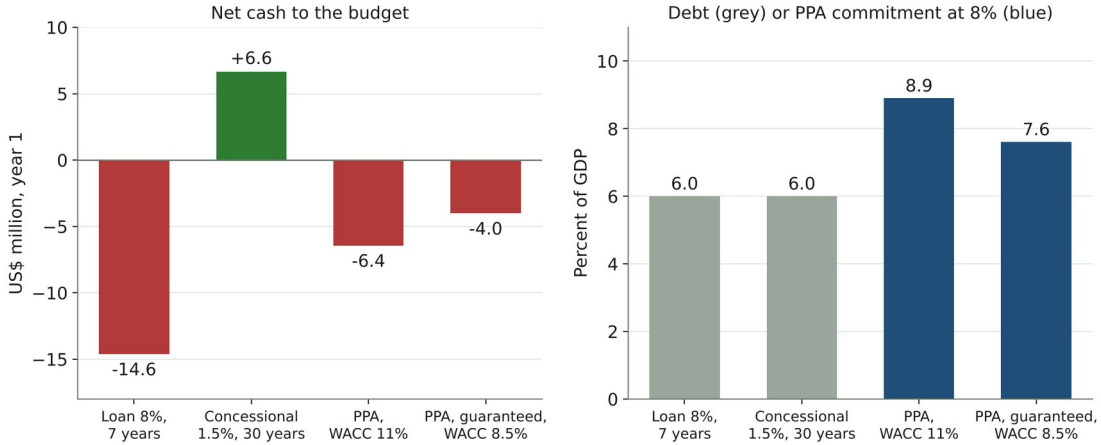
Count only the gap the private sector will not fill, and charge delivery losses once: efficiency gaps are 40% in low-income countries.

Revenue that comes back saves more than a dollar of tax; who keeps a fuel saving changes the budget case, not the economic value.

With a cost of funds of one, the rule is the World Bank's usual net present value test.

Source: Working paper 6.3, Propositions 2–3; Hendren and Sprung-Keyser (2020); Auriol and Warlters (2012); IMF (2015).

A solar plant worth $108 million passes every test but cash on a seven-year loan



Loan 8%, 7 years: value per budget dollar 4.2, but $14.6m a year short and debt up 6% of GDP.

Concessional loan: +$6.6m a year from the start.

PPA: off the debt figures, but commitments worth 7.6–8.9% of GDP.

Stylized island: $2bn GDP, 85% debt, diesel power; $120m solar plant saving $20.5m a year.

Source: Working paper 6.3, worked example, Table 2 (sids_worked_example.py).

Tenor eases cash but not cost, and a power purchase agreement is debt in disguise

Tenor is not price. At the government's own rate the 7- and 25-year loans cost the same (−$38m); a fixed cost of funds even prefers the short one.

Only a cost of funds that rises in cash-short years flips the ranking ($63m against $28m).

A PPA priced above the government's rate commits more than the plant costs: an excess of $31m unguaranteed, $5m guaranteed.

The guarantee cuts the producer's rate from 11% to 8.5% and is worth about $31m to the island.

Source: Working paper 6.3, Propositions 3–4 and Table 2; Engel, Fischer and Galetovic (2013).

Country runs: 2030 needs of 4–5% of GDP, and the increment pays only when cleaner air counts

	Kenya	Uganda	St Lucia
Total investment (% of GDP)	4.7	4.0	4.4
Market cost of capital (%)	9.7	8.5	10.5
Incremental cost at market rate ($m/yr)	120	56	−1.2
Incremental cost at 6% ($m/yr)	68	39	−2.3
At 6% with local co-benefits ($m/yr)	−7	−3.5	−3.0

Positive is a net cost. Uganda's SISEPUEDE run: net-zero worth $161bn at 6%, but only 18% of benefits are cash a budget would see. Illustrative tool results, not official estimates.

Source: Working paper 6.3, Table 3; Mitigation Investment Needs Model v1.1 (2026); SISEPUEDE Uganda run (Oct 2025).

What to do

What the extensions show

Cost of capital decides: break-even at 12.6% for a typical clean asset.

Each point is worth about $36bn a year per year of global clean energy investment.

Cash, not value: the island plant is worth $108m but leaves the budget $14.6m a year short.

Hidden liabilities: PPA commitments exceed the debt they avoid.

Actions

Finance ministries: ask for needs at your own cost of capital and at 6%, side by side.

Debt managers: use a cost of funds that rises when cash is short; count PPA commitments as liabilities.

Teams running CPAT: say which cost-of-capital setting and convention you used.

The CPAT team: publish the cost of capital by country and technology as open data.