SUPPORTING INFORMATION

for

Financing the Green Transition: A Finance-Technology Matching Framework with Multi-Case Plausibility Probe

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Appendix A. Systematic Literature Review Protocolrences

The protocol was finalized before search execution and follows Tranfield, Denyer, and Smart [36] and PRISMA 2020 reporting [37]. Review question: which financial structures match which green-technology.

Attribute profiles, and under which conditions does mismatch produce financing failure? Scope: peer-reviewed academic articles and reports from recognized institutions, January 2020 to April 2026, with foundational pre-2020 works retained were canonical

Table 8. Six falsifiable propositions

Database / source	Search string (illustrative)	Filters applied
Scopus	TITLE-ABS-KEY(("sustainable finance" OR "green finance" OR "climate finance" OR "transition finance") AND ("green innovation" OR "green technology" OR "clean energy" OR "circular economy" OR "carbon capture" OR "green hydrogen") AND ("capital allocation" OR "cost of capital" OR "financ*" OR "green*um" OR "additionality" OR "greenwashing"))	2020-2026; English; article or review; Business, Economics, Energy, Environmental Science. Records: 1,247.
Web of Science Core Collection	TS=(("green bond*" OR "sustainability-linked" OR "green credit" OR "transition finance" OR "blended finance" OR "impact invest*") AND ("capital allocation" OR "financ*" OR "innovation" OR "cost of capital"))	2020-2026; Article; Q1/Q2 prioritized. Records: 893.
SSRN	Corporate Finance, Asset Pricing, Banking, Sustainability categories; concept blocks as Scopus.	Working papers and forthcoming articles. Records: 187.
Google Scholar	"finance technology matching"; "green bond additionality"; "sustainability-linked bond premium"; "transition finance credibility".	2020-2026; top 200 by relevance. Records: 64.

Institutional sources	Direct retrieval from IEA, ICMA, IFRS Foundation, IOSCO, OECD, NGFS, IFC, Climate Bonds Initiative, Convergence, GIIN, IRENA, Hydrogen Council, UNEP FI.	Most recent year; verified against organizational documentation. Records: 36.

Note: Search strings shown in executable Boolean form. Scopus uses TITLE-ABS-KEY; Web of Science uses TS (topic). Counts reflect searches January-April 2026

Inclusion criteria	Exclusion criteria
Direct relevance to capital allocation, financial instruments, or green technology deployment.	General sustainability discussion without a finance link.
Peer-reviewed academic journal or recognized institution.	Non-peer-reviewed commentary, blog posts, unverified press.
Contributes to greenwashing, additionality, disclosure quality, transition credibility, or EMDE financing gaps.	Overlapping coverage already represented.
Supports the matching lens or one of the six analytical dimensions.	Predatory or unranked journals; methodology unclear.
2020-2026 (or earlier if foundational).	Could not be cross-verified.

Note. Criteria applied sequentially at title-abstract screening and full-text review

Single-coder safeguards

The review was conducted by a single coder. Three safeguards were applied: (1) explicit written decision rules finalized before screening; (2) retention of all borderline cases at the title-abstract stage for full-text review; (3) triangulation

of every retained source used to support a main-text empirical claim against at least one

alternative source. These safeguards reduce but do not eliminate single-coder bias; a second-

coder replication is identified as a priority in Section 9.3.

Appendix B. Quality Assessment Criteria

Five criteria for academic studies: (i) clarity of research question and alignment with the matching lens; (ii) transparency of data, sample, and methodology; (iii) appropriateness of empirical strategy or theoretical model; (iv) outlet quality, with priority to journals indexed in Scopus and Web of Science and ranked in upper quartiles (including ABDC and CABS lists where applicable); and (v) contribution to one or more of the six matching attributes. Studies satisfying at least four criteria were retained.

Four criteria for institutional sources: (i) standing and independence of the issuing organization; (ii) transparency of data and methodology; (iii) recency (most figures from 2023-2025); and (iv) ability to inform the matching framework. Where data overlapped, the most authoritative or recent source was retained. Key empirical claims, especially headline market sizing and case-specific figures, were triangulated against at least two independent sources where feasible.

Appendix C. Full Six-Tension Set

Section 7 reports the three principal tensions in the main text. Table C1 reports the three further tensions identified in the review.

Table C1. Three further tensions in technology-driven sustainable finance

Tension	Core conflict	Implication for matching

Green innovation vs. financial returns	Many green technologies create long-term public value but uncertain near-term private returns; preferences and risk pricing pull in opposite directions [17,18].	Capital structures must compensate for time horizons and risk profiles, not only environmental quality.
SLB penalty design vs. signalling	Primary-market SLB premium is uncorrelated with step-up size and attenuates to 1-2 bp secondary; 14-39% of targets are missed [10,11].	SLBs deliver modest signalling and modest repricing; not a substitute for credible transition planning.
Impact measurement vs. innovation logic	Strict measurement may favour established technologies and disadvantage emerging or systemic innovations [29,30].	Impact frameworks must accommodate diverse pathways without abandoning credibility.

Note. These tensions complement those in Table 5 and are also discussed in the relevant sections (4.2,)