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Green Hydrogen Corridors, Value Capture, and SDG Trade-offs in the Global South

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Exporting the Energy Transition: Green Hydrogen Corridors, Value Capture, and SDG Trade-offs in the Global South

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ABSTRACT: *Background.* Green hydrogen is promoted as an export commodity for the Global South, yet analyses rarely examine how its economic rents are divided among host states, foreign developers and importing offtakers. *Objective.* We ask whether export corridors enable sustainable industrialisation or reproduce resource dependence. *Method.* A comparative multiple-case design covers six corridors (Morocco, Egypt, Namibia, the Gulf, India and Chile/Latin America) using public evidence graded in four tiers to November 2026. A six-rent taxonomy and a six-dimension, 0–3 host-capture scorecard are tested against five hypotheses derived from FDI theory, MNC bargaining, global value chain governance and institutional theory. Robustness is assessed with four weighting schemes, leave-one-dimension-out analysis and a 10,000-run score-perturbation simulation. *Results.* Green ammonia prices observed in India's auctions carry premiums of 11–44% over grey ammonia, and the 2024 H2Global tender settled 124% above it; bankability depends on aggregated or long-term buyers, while about 78 African projects lack firm offtake. India (13 of 18 points) and the Gulf (11) lead. India ranks first under all four weighting schemes and in 93% of perturbation runs (80% without ties); the order of the middle tier depends on weighting. *Conclusions.* Host capture is associated with state demand aggregation, equity and domestic use rather than resource quality. Corridors advance SDGs 7, 9 and 13 but risk costs to SDGs 10 and 17 where exports remain molecule-only enclaves. We offer stakeholder guidance and testable propositions for empirical follow-up.

KEYWORDS: green hydrogen; export corridors; value capture; resource dependence; bargaining power; global value chains; Global South; sustainable development goals

JEL CLASSIFICATION: F23; O13; Q42; Q56

HIGHLIGHTS: Hydrogen export corridors analysed as a rent-distribution problem • Six-rent taxonomy and scorecard compare six Global South corridors • Buyer power, not resource quality, shapes host value capture • India and the Gulf lead; the middle tier depends on weighting • State aggregation and domestic use favour industrialisation, not enclaves

1. Introduction

Hydrogen produced from renewable electricity is expected to decarbonise sectors that direct electrification reaches poorly, notably fertilisers, steel, chemicals, shipping and aviation. Global hydrogen demand was about 97 Mt in 2023, with low-emissions production still below 1% of supply [1]. Importers have set ambitious targets, including 10 Mt of renewable hydrogen imports a year by 2030 under the European Union's REPowerEU plan [2], and producing countries from Morocco and Namibia to Oman, Chile and India have launched strategies, land programmes and subsidy schemes. For policy makers in the Global South the promise is double: a new export base and a route to industrialisation built on cheap renewable power.

The literature has so far concentrated on the geopolitics and governance of a future hydrogen market [3, 4, 5] and on the industrial logic of green value chains [6]. A parallel body of work warns that resource-based export strategies can entrench dependence [7, 8, 9], but disagrees on whether the "curse" is inevitable or conditional on institutions [10, 11]. Research on multinational corporations (MNCs) shows that large firms shape the distributional consequences of trade and coordinate politically to protect their position [12], while FDI studies find that host-country conditions such as market size, infrastructure and trade openness determine whether investment materialises [13]. These strands have not been brought together to ask the distributional question for hydrogen: *who captures the economic and technological rents along an export corridor*, and under what conditions do hosts keep enough of them to industrialise?

The question is pressing because announcements are running ahead of bankable contracts. About 78 green hydrogen projects have been proposed in Africa, yet many lack firm offtake, pipeline infrastructure and a local

supply chain [14]. In Oman the USD 6.7 bn HyDuqm project was cancelled in December 2025 after a review of global offtake conditions [15]. In India, only about 8,000 t a year of capacity had been commissioned outside the subsidy scheme by February 2026, against a target of 5 Mt for 2030 [16]. Scarce bankable demand shifts bargaining power, and the consequences for host economies have not been systematically compared.

Purpose and research question. This paper asks: *Do green hydrogen export corridors enable sustainable industrialisation in producing countries, or do they reproduce new forms of resource dependence?*

Contribution. The paper makes four contributions. (1) It frames export corridors as a distribution problem among host states, developers and offtakers, extending FDI and MNC bargaining scholarship [12, 13, 17] to a commodity whose location is set by renewable-resource quality. (2) It proposes a six-rent taxonomy and a host-capture scorecard that make rent allocation observable and contestable. (3) It contrasts an *enclave pathway* (molecule export) with an *embedded pathway* (domestic conversion into exportable products) and links each to SDG outcomes. (4) It shows, through sensitivity and simulation analysis, which conclusions are robust to coding uncertainty and which are not. The audience is researchers in international business and energy policy, host-country policy makers, developers, offtakers and lenders. Section 2 develops the theory and hypotheses; Section 3 sets out the methodology; Section 4 reports results; Section 5 discusses findings, implications, limitations and future research; Section 6 concludes.

2. Theoretical Background and Hypotheses

The literature is organised by theme, with agreements, conflicts and implications for hydrogen summarised in Table 1.

2.1 FDI, dependency and the middle path

Three views relate FDI to development: dependency theory, classical theory and a middle path [13]. Dependency theorists argue that rewards are inequitably shared, that MNCs repatriate profits, use capital-intensive technology and ally with local elites [18, 19]. Classical theorists stress capital, skills and technology transfer and integration into world markets, including productivity spillovers through backward linkages with local suppliers [20]. The middle path holds that benefits materialise when host economies meet initial conditions and combine openness with regulation [13]. A hydrogen export project can be read through either lens, which is why host conditions, not the technology, are the object of analysis.

2.2 What attracts investment: market-seeking versus resource-seeking FDI

The eclectic (OLI) paradigm explains foreign production by ownership, location and internalisation advantages [21]. In a panel of BRICS and MINT economies, market size, infrastructure and trade openness significantly attract FDI while natural-resource endowment and institutional quality are insignificant, implying mainly market-seeking investment [13]. Hydrogen export is resource-seeking in that sun, wind and land fix location, but it also depends on ports, grids, finance and policy. Because renewable resources are abundant across many candidate hosts, a host's leverage must come from infrastructure, institutions and human capital, the conditions for absorbing spillovers [13, 22].

2.3 Resource dependence and the conditional resource curse

Resource-dependent economies have often grown slowly [8, 9], and political-economy explanations stress rent seeking and weak institutions [23]. Yet evidence suggests the effect is conditional: where institutions are producer-friendly, resources can be a blessing, and where they are grabber-friendly, a curse [10, 11]. This conditionality motivates a hypothesis that institutional capacity moderates host capture in hydrogen corridors.

2.4 MNC power, bargaining and the obsolescing bargain

MNCs control most global production networks, and their political behaviour shapes who gains from trade; firms mobilise collectively through associations while regulators struggle to hold parents accountable across value chains [12]. Vernon's "obsolescing bargain" holds that an investor's power is greatest before capital is sunk and declines afterwards as the host gains leverage over immobile assets [17]. In hydrogen corridors a third party, the offtaker, complicates the dyad. Porter's buyer-power logic [24] and resource-dependence theory [25] suggest that when bankability depends on one creditworthy buyer, the buyer's power need not obsolesce with sunk

investment and may rise again at contract renewal.

2.5 Global value chains, rents and regulation

Value chain research shows that gains accrue to the governing firms that control design, finance and market access rather than to input suppliers [26], although upgrading is possible where linkages are cultivated [27]. Who captures returns from technology depends on control of complementary assets such as finance, distribution and standards [28]. Regulation is itself a source of power: EU rules on renewable fuels of non-biological origin impose additionality and temporal and geographic correlation requirements [29, 30], and the Carbon Border Adjustment Mechanism covers hydrogen, ammonia, fertilisers and steel [31]. Together they create a regulatory and carbon rent for the rule-setter unless exporters negotiate it.

2.6 Institutional voids, embeddedness and localisation

Emerging-market research identifies institutional voids, the absence of well-functioning market-supporting institutions, and the strategies firms use to internalise or bridge them [32, 33]. MNEs are embedded in multiple local contexts that shape their opportunities [34]. A recent review of MNE strategy in India concludes that success depends on institutional ambidexterity, localisation of value chains and partnerships that bridge formal and informal gaps, with sub-national variation moderating outcomes [35]. For hydrogen the relevant voids are project finance, grid and port infrastructure, certification capacity, water governance and skills.

2.7 Hydrogen geopolitics and energy justice

Hydrogen studies emphasise new exporter–importer relationships and governance gaps [3, 4], and renewable-energy geopolitics scholarship cautions against assuming that renewables dissolve dependence [5, 36]. Energy justice research adds that benefits and burdens, including land and water, are unevenly distributed [37], which bears on SDGs 7 and 10.

Table 1. Thematic synthesis of the literature.

Theme	Where the literature agrees	Where it conflicts	Implication for hydrogen corridors
FDI and development	FDI can transfer skills and technology under conditions	Dependency versus classical views	Host conditions and bargaining decide outcomes (middle path)
Determinants of FDI	Market size, infrastructure and openness attract FDI (BRICS/MINT)	Role of natural resources	Hydrogen is resource-seeking; infrastructure and institutions give host leverage
Resource curse	Resource dependence can slow development	Inevitable or conditional on institutions	Institutional capacity moderates capture (H4)
MNC power and bargaining	MNCs shape trade outcomes	Obsolescing bargain versus persistent MNC power	Offtaker adds a third bargaining party (H1, H5)
GVCs and upgrading	Governing firms capture more value	Whether upgrading is feasible	Embedded pathway needs local linkages (H3)
Hydrogen geopolitics	New exporters and importers emerge	Exporter leverage versus importer standard-setting	Distribution of rents within corridors is unstudied

2.8 Conceptual framework and hypotheses

Figure 1 integrates these strands. Structural drivers (buyer concentration, importer regulation, technology and finance concentration) act on host value capture through state-controlled mediators, and capture determines whether corridors support sustainable industrialisation or dependence. Five hypotheses follow.

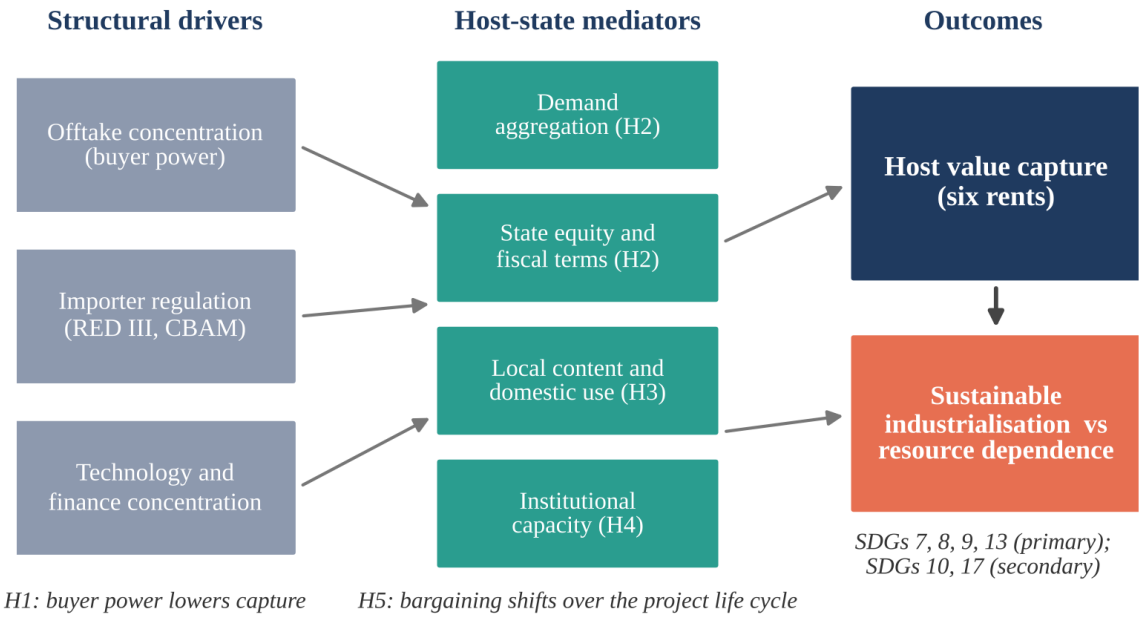


Figure 1. Conceptual framework: structural drivers, host-state mediators and outcomes (author's synthesis).

H1 (offtake power). Host capture of price and carbon rents is lower where bankability rests on a single long-term foreign offtaker than where demand is aggregated. **H2 (state role).** Host capture is higher where the state aggregates demand and holds equity or a revenue share. **H3 (embeddedness).** Domestic downstream use and local manufacturing raise the industrial learning content per tonne exported. **H4 (institutional capacity).** State equity and local-content terms deliver capture only where institutions can finance, certify and build supporting infrastructure. **H5 (bargaining life cycle).** The host's bargaining position improves after investment is sunk, but only where offtake is diversified; with a single buyer the offtaker retains power through renewal and certification.

3. Methodology

3.1 Research design and justification

The study is a comparative multiple-case design. A case approach is appropriate because the phenomenon is recent, context matters and panel data on realised outcomes do not yet exist [38, 39, 40]. Comparison across cases allows pattern matching and congruence testing of hypotheses against evidence [41, 42]. Because most projects are pre-final-investment-decision (FID), outcomes such as employment cannot yet be measured; the design therefore compares *contract and policy structures* that determine who is positioned to capture rents. Table 2 aligns each hypothesis with indicators, data and analysis, and Figure 2 summarises the research process.

Table 2. Alignment of hypotheses, indicators, data and analysis.

Hypothesis	Observable indicator	Data source	Analysis
H1	Offtake structure (single buyer, aggregated, none); project status (financed, cancelled); price premium	Auction results; offtake announcements; cancellations	Pattern matching; premium calculation
H2	State aggregation and equity versus scorecard totals	Programme documents; equity agreements	Scorecard; weighting sensitivity
H3	Domestic use and local manufacturing scores	Programme design; auction rules	Congruence test
H4	Financing and certification capacity; state financing constraints	Official statements; press	Within-case description
H5	Contract timing; equity timing; renewal terms	Offtake and concession terms	Conceptual assessment (untested)

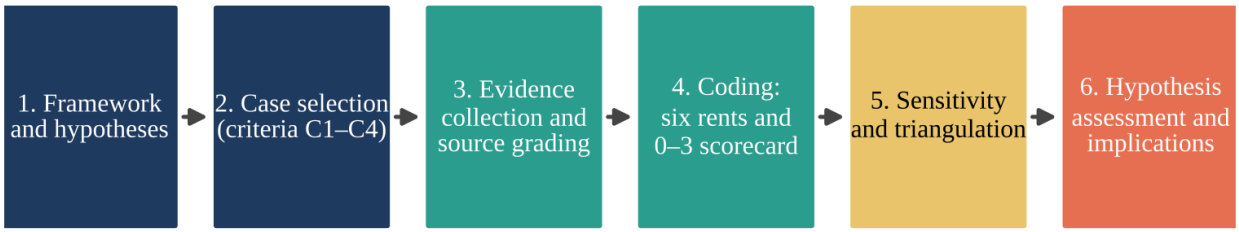


Figure 2. Research design.

3.2 Cases and setting

Corridors were included if they met four criteria: (C1) a host in the Global South; (C2) an export-oriented hydrogen or derivative strategy or flagship project; (C3) public documentation of at least one structural milestone by November 2026 (land allocation, equity arrangement, auction, offtake agreement or cancellation); and (C4) coverage of the corridors named in the research brief (North Africa–Europe, Latin America–Asia, India–Middle East) plus Southern Africa. Six cases resulted (Table 3). The Gulf case combines a financed flagship and a cancellation to capture within-region variance. Cases not included, such as other Latin American and African hosts, are noted as a limitation.

Table 3. Export corridor profiles (data as of November 2026).

Corridor / host	Flagship and scale	Status and governance model
North Africa–Europe: Morocco	"Offre Maroc": about 1 Mha identified, 300,000 ha first tranche, plots up to 30,000 ha; five investor groups, headline value USD 32–35 bn [43]	Preliminary land agreements signed Feb. 2026; pre-FID; state supplies land and shared infrastructure
North Africa–Europe: Egypt	Suez Canal zone hub; ammonia producer Fertiglobe won the first H2Global lot (2024) [44]	Existing fertiliser base; early offtake via German-backed intermediary
Southern Africa: Namibia	Hyphen, USD 10 bn, 4,000 km² inside Tsau//Khaeb National Park [45]	24% state equity via SDG Namibia One; government expects over 40% of distributions [46]
Gulf: Saudi Arabia, Oman	NEOM: 2.2 GW, USD 8.4 bn, 30-year fixed-price ammonia offtake by Air Products [47]. HyDuqm (Oman, USD 6.7 bn) cancelled Dec. 2025 [15]	Sovereign-backed capital; financing closed only with a long-term buyer
India (and India–Middle East)	NGHM: 5 Mt/yr by 2030, outlay INR 19,744 crore (about USD 2.4 bn), about 125 GW renewables [48]	State aggregator (SECI) runs reverse auctions; incentive for electrolyser making; exports aimed from about 2028–29
Latin America–Asia: Chile	National strategy (2020) aims at low-cost exports to Asia [49]	Mostly pre-FID; competitive wind and solar resource; buyers in Japan and Korea

3.3 Data sources and evidence collection

Evidence was gathered by structured web and document searches in November 2026 covering government strategies and legislation, intergovernmental reports, auction results, company announcements and business and trade press. Each item was graded in four tiers (Appendix B) and logged with its verification status (Appendix C). Key claims rely on tiers 1–3; aggregator and blog material was used only to locate primary reports. Conflicting figures are reported as such: for example, other reporting cites a wider range of Indian green ammonia bids than official summaries. A formal bibliographic search in Scopus and Web of Science was not part of the evidence collection; the literature base in Section 2 is therefore a purposive, theory-driven selection rather than a systematic review.

3.4 Instruments: six-rent taxonomy and scorecard

Six-rent taxonomy. Value created along a corridor is decomposed into resource, technology, financial, midstream, regulatory and carbon rents (Table 4). **Host-capture scorecard.** Each corridor is scored 0–3 on six dimensions with explicit anchors (Table 5). The six dimensions operationalise H1–H4: state equity (H2), domestic downstream use and local manufacturing (H3), offtake security (H1), fiscal and land terms, and water/land safeguards (H4 and SDG outcomes).

Table 4. Six-rent taxonomy.

Rent	Main holder today	Host-state lever
Resource (land, sun, wind, water)	Host	Royalties, lease terms, local equity
Technology (electrolysers, controls)	Equipment makers abroad	Local content, joint ventures, R&D
Financial	Developers, DFIs, banks	State equity vehicles, blended finance
Midstream (ports, shipping)	Shippers, terminal operators	Port and terminal ownership
Regulatory (certification)	Importing regulators	Regional standards, mutual recognition
Carbon (premiums, CBAM exposure)	Importers, offtakers	Price and premium sharing clauses

Table 5. Scorecard dimensions and scoring anchors (score 2 = intermediate).

Dimension	Score 0–1 (weak host capture)	Score 3 (strong host capture)
State equity / revenue share	Land rent and taxes only	Public stake or revenue share well above taxes, with a funded vehicle
Domestic downstream use	Export-only; no domestic offtake	Hydrogen feeds local fertiliser, steel or fuels at scale
Local manufacturing / tech transfer	Imported equipment and skills	Electrolyser, balance-of-plant and skills built locally
Offtake security	No binding buyer	Binding long-term buyer with credit support and review terms
Fiscal and land terms	Generous holidays or giveaways, little return	Fair rents, balanced incentives, clear fiscal return
Water / land safeguards	Weak or unenforced	Binding conditions of concession, enforced

3.5 Coding procedure and analysis strategy

Evidence for each corridor was coded against the anchors in Table 5 by a single coder (the author), recording the rationale and sources for every score (Appendix A). Analysis proceeded in four steps. (1) *Descriptive pattern matching* of offtake structure, price evidence and project status (H1). (2) *Scorecard totals* under four weighting schemes: equal weights (A); industrialisation weighting, with domestic use and local manufacturing doubled (B); bankability weighting, with equity and offtake doubled (C); and sustainability weighting, with fiscal terms and safeguards doubled (D). (3) *Leave-one-dimension-out* (jackknife) analysis. (4) A *score-perturbation simulation*: in each of 10,000 runs (seed 42), every score is shifted by ±1 with probability 0.25 and clipped to 0–3, approximating the effect of coder disagreement on the ranking. The simulation is not an inter-rater reliability test, which remains for future work.

3.6 Rigour, ethics and reporting

Trustworthiness follows Lincoln and Guba's criteria [50]: *credibility* through triangulation across source tiers and flagging of conflicting figures; *transferability* through thick case description (Table 3, Appendix A); *dependability* through an audit trail (Appendix C); and *confirmability* through score-level rationale. *Reflexivity:* single-coder judgement is acknowledged as a limitation. Reporting follows SRQR where applicable [51]. The study uses only public documents and involves no human participants; ethics approval was not required.

4. Results

4.1 Case narratives

Morocco. The state's core instrument is land: one million hectares identified, with an initial 300,000 ha offered in plots of up to 30,000 ha to selected consortia [43]. This is a resource-rent model; public equity is limited and binding offtake has not been reported. **Egypt.** Egypt combines an existing ammonia and fertiliser industry with the Suez Canal zone, and an early H2Global lot gave an exporter a priced European buyer [44]. **Namibia.** The Hyphen agreement gives the state a 24% stake through a dedicated blended-finance vehicle, with the government expecting over 40% of distributions [46]; the state must nonetheless finance its stake under fiscal constraints and has relied on blended finance and development-bank support [45]. **Gulf.** NEOM's financing closed on a 30-year fixed-price offtake [47], whereas HyDuqm could not proceed when offtake conditions proved weak [15]. **India.** A state aggregator runs reverse auctions that bundle fertiliser demand; the first green ammonia auction cleared at INR 55.75/kg (about USD 641 per tonne), well below the INR 100.28/kg-equivalent of the 2024 H2Global tender [52, 53]. **Chile.** The national strategy targets low-cost production for Asian markets [49]; binding contracts are thin and the corridor is treated as pre-FID.

4.2 Value-chain position and rent allocation

Figure 3 maps the stages of a corridor to their typical owners. Hosts hold the upstream, capital-intensive stages (renewable power, electrolysis, synthesis), whose employment is concentrated in construction; importers hold the downstream stages (cracking, steel, fertiliser) and the regulatory and carbon rents. Flagship projects rely on imported stacks and systems, so technology rent accrues mainly to equipment makers; India's production incentives linked to domestic electrolyser manufacturing are the clearest attempt to claim it [48].

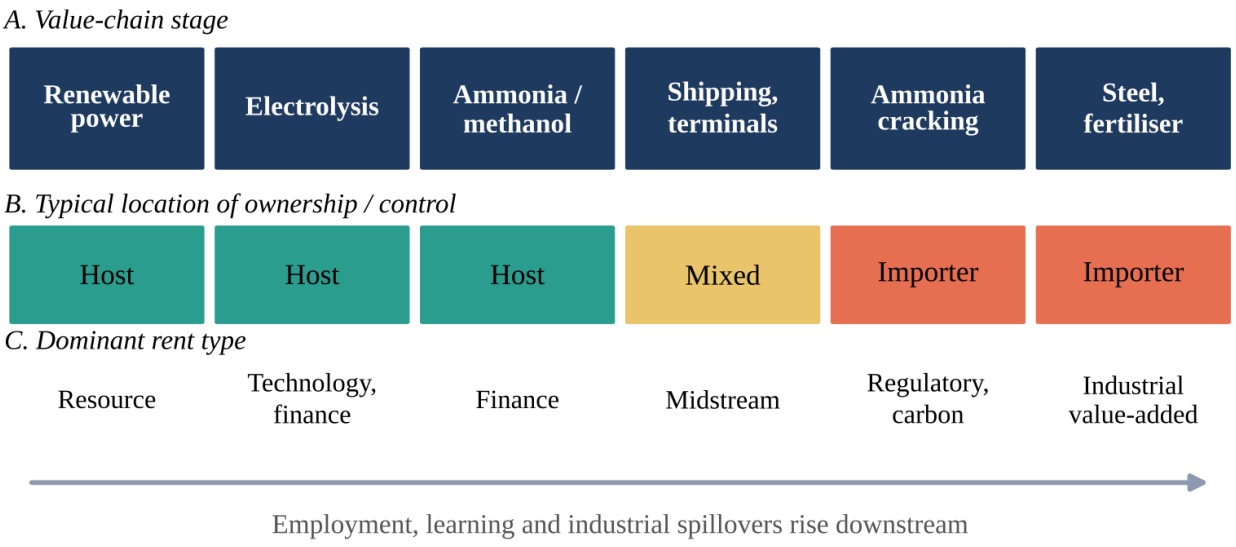


Figure 3. Stylised hydrogen export value chain, typical ownership location and dominant rent type (author's conceptual synthesis).

4.3 Offtake structure, price evidence and bankability (H1)

Grey ammonia traded near USD 515 per tonne in March 2025. India's first green ammonia auction cleared at about USD 641 per tonne, 24% above grey, and results ranged from INR 49.75 to 64.74/kg, about USD 572–744 per tonne (11–44% above grey) at the implied exchange rate [53]. The 2024 H2Global tender settled at about USD 1,153 per tonne, 124% above grey [52] (Figure 4). Even the cheapest outcomes carry a premium, and the premium was paid only where a creditworthy buyer was organised: India aggregates fertiliser demand, Germany funds an intermediary, and NEOM closed on a 30-year contract. Table 6 lists the bankability signals of 2025–26: price discovery in India and land allocation in Morocco show that governments move quickly on the supply side, but the Oman cancellation and the African offtake gap show that readiness alone does not bring investment. Evidence is congruent with H1, though the price-capture test cannot be run until contracts are disclosed.

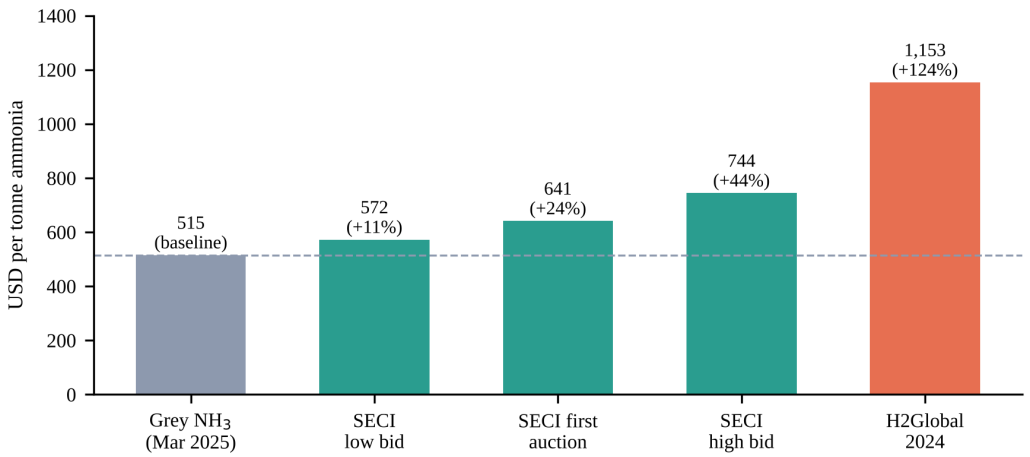


Figure 4. Ammonia price points (USD/t) and premium over grey ammonia. SECI values converted at about INR 87/USD (implied by the first auction). Domestic delivered prices are not directly comparable with export CIF prices; sources [52, 53].

Table 6. Selected bankability signals, 2025–26.

Date	Signal	Reading
Aug. 2025	SECI's first green ammonia auction clears at INR 55.75/kg [53]	Aggregated domestic demand lowers price
Dec. 2025	HyDuqm (Oman) cancelled after offtake review [15]	Supply readiness is not enough
Jan. 2026	78 African projects proposed, many without firm offtake [14]	Large gap between pipeline and bankable projects
Feb. 2026	Morocco signs land agreements with five investor groups [43]	State moves first on land, buyers later
Feb. 2026	About 8,000 t/yr commissioned in India outside subsidy [16]	Targets far ahead of delivery

4.4 Host-capture scorecard (H2, H3)

Figure 5 and Table 7 present the scorecard. India leads with 13 of 18 points, combining state aggregation, domestic fertiliser and refinery demand and an electrolyser manufacturing incentive [48]. The Gulf scores 11: sovereign capital holds equity and secured a long-term buyer at NEOM, but local manufacturing and domestic use are limited. Namibia's state equity is strong, but offtake is not yet binding and the site lies in a protected area. Morocco, Egypt and Chile score 8–9.

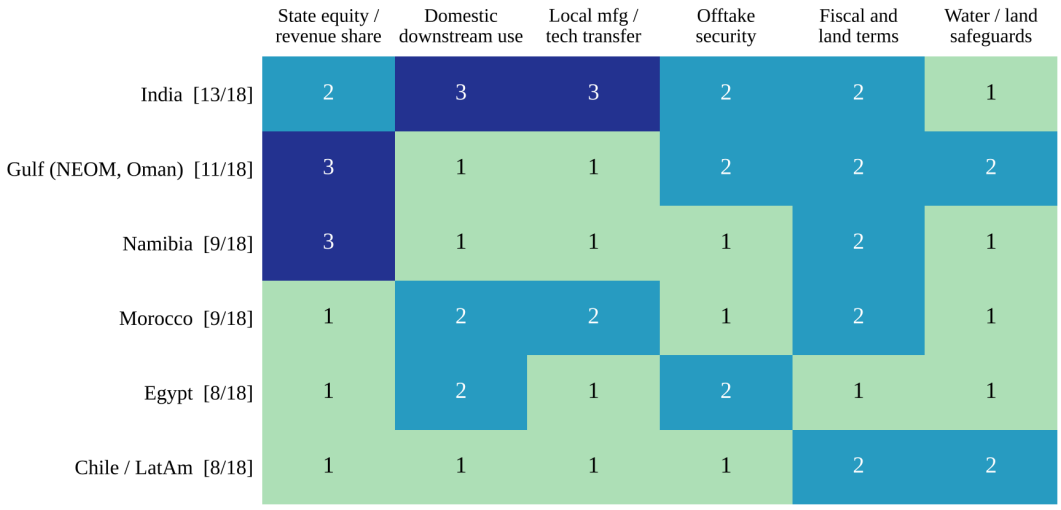


Figure 5. Host-capture scorecard (0–3 per dimension; row total in brackets). Author's ordinal assessment from public information.

Table 7. Scores by dimension and weighted totals under schemes A–D (rank in brackets). Eq. = state equity; Dom. = domestic use; Mfg = local manufacturing; Off. = offtake; Fisc. = fiscal terms; Safe. = safeguards. A: equal; B: domestic use and manufacturing ×2; C: equity and offtake ×2; D: fiscal terms and safeguards ×2.

Corridor	Eq.	Dom.	Mfg	Off.	Fisc.	Safe.	A	B	C	D
India	2	3	3	2	2	1	13 (1)	19 (1)	17 (1)	16 (1)
Gulf (NEOM, Oman)	3	1	1	2	2	2	11 (2)	13 (2)	16 (2)	15 (2)
Namibia	3	1	1	1	2	1	9 (3)	11 (4)	13 (3)	12 (3)
Morocco	1	2	2	1	2	1	9 (3)	13 (2)	11 (4)	12 (3)
Egypt	1	2	1	2	1	1	8 (5)	11 (4)	11 (4)	10 (6)
Chile / LatAm	1	1	1	1	2	2	8 (5)	10 (6)	10 (6)	12 (3)

4.5 Robustness

India ranks first and the Gulf second under all four weighting schemes (Table 7), with the exception that Morocco ties the Gulf for second under scheme B. In the leave-one-dimension-out analysis (Table 8), India ranks first whichever dimension is dropped; the Gulf ranks second in four of six cases and ties for first when domestic use or local manufacturing is dropped. Under the 10,000-run perturbation simulation (Figure 6), India ranks first in 93% of runs (strictly first in 80%) and the Gulf is in the top two in 86%; India and the Gulf are jointly the top two in 86% of runs. Namibia and Morocco swap places depending on weighting and perturbation, and Egypt and Chile are indistinguishable. The conclusion that India and the Gulf lead is therefore robust; the ordering of the other four corridors is not.

Table 8. Leave-one-dimension-out totals (maximum 15) and ranks in brackets.

Corridor	Drop equity	Drop domestic	Drop mfg	Drop offtake	Drop fiscal	Drop safeguards
India	11 (1)	10 (1)	10 (1)	11 (1)	11 (1)	12 (1)
Gulf	8 (2)	10 (1)	10 (1)	9 (2)	9 (2)	9 (2)
Namibia	6 (6)	8 (3)	8 (3)	8 (3)	7 (3)	8 (3)
Morocco	8 (2)	7 (4)	7 (4)	8 (3)	7 (3)	8 (3)
Egypt	7 (4)	6 (6)	7 (4)	6 (6)	7 (3)	7 (5)
Chile	7 (4)	7 (4)	7 (4)	7 (5)	6 (6)	6 (6)

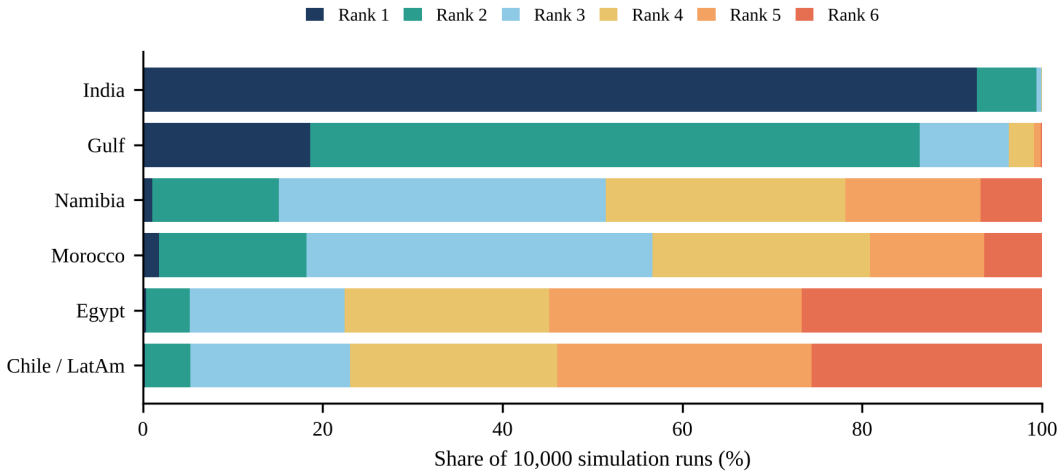


Figure 6. Distribution of corridor ranks across 10,000 score-perturbation runs (each score shifted by ±1 with probability 0.25).

4.6 Assessment of hypotheses

Table 9. Assessment of hypotheses against the evidence.

Hypothesis	Evidence	Assessment
H1 Offtake power	NEOM financed on one 30-year buyer; HyDuqm cancelled; African projects stalled for lack of offtake	Congruent; direct price-capture test not yet possible
H2 State role	India (aggregation) and Namibia (equity) lead on capture indicators; India and Gulf robustly top two	Congruent; equity alone insufficient (see H4)
H3 Embeddedness	India's domestic fertiliser demand and manufacturing incentive	Congruent; no export-scale outcomes yet
H4 Institutional capacity	Namibia's financing constraint; India's institutional stack	Partly supported
H5 Bargaining life cycle	Pre-FID leverage with developers; buyer power persistent	Conceptually plausible; untested

5. Discussion

5.1 Principal findings

Three findings stand out. First, hydrogen rents are allocated by control of scarce assets, above all a bankable buyer, not by resource quality. Second, host capture is highest where the state aggregates demand, holds equity and requires domestic use; India and the Gulf lead robustly, while the order of the remaining corridors depends on whether industrialisation, bankability or sustainability is prioritised. Third, embedding hydrogen in domestic industry, rather than exporting the molecule, is the pathway most consistent with industrialisation.

5.2 Interpretation against the literature

Agreement. The results are consistent with the middle-path view that outcomes depend on host conditions and regulation [13], and with the conditional resource-curse argument that institutions determine whether resource rents build or erode development [10]: Namibia's equity share is only as valuable as the state's capacity to finance it. They agree with GVC research that governing firms capture more value than input suppliers [26], with the difference that in hydrogen the governing party is the offtaker or the certifying regulator rather than the lead manufacturer. Teece's argument that returns go to holders of complementary assets [28] explains why technology rent flows to those who also control finance and market access. *Extension.* Asongu et al. find market size significant and natural resources insignificant for FDI inflows to BRICS and MINT [13]. The hydrogen evidence is compatible with this at the level of capture: India's large domestic fertiliser market supports embedded demand, whereas resource quality alone does not predict capture. *Divergence.* Vernon's obsolescing bargain predicts rising host leverage after investment [17]; our three-party view qualifies this, since the offtaker's leverage persists and may rise at renewal. Backward-linkage spillovers [20] require local supplier capacity, which the Gulf and Namibia cases lack.

5.3 Theoretical contributions

The paper contributes to theory in three ways. (1) It extends the obsolescing-bargain logic to a three-party corridor setting in which the offtaker's power is not eroded by sunk investment (Figure 7). (2) It supplies a rent taxonomy that links technology, finance, midstream and regulatory control to value capture, bridging FDI, GVC and energy geopolitics scholarship. (3) It proposes that, for green resources, host institutional capacity conditions whether resource-based export becomes an enclave or a platform, a proposition for testing once outcome data exist.

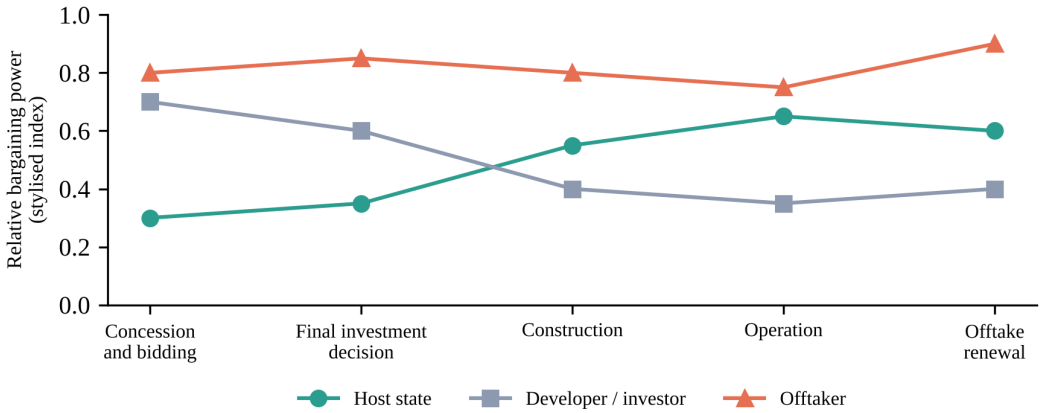


Figure 7. Stylised bargaining power over the project life cycle (illustrative, not measured).

5.4 Practical and policy implications

Five conditions appear to separate corridors that build industrial capacity from those that mainly export molecules: (1) demand aggregation by a public or regional entity; (2) local-content and equity terms in concessions; (3) domestic-first allocation of power, water and hydrogen; (4) price and carbon-premium sharing clauses in offtake contracts; and (5) safeguards that bind before financial close. None of the cases meets all five. Figure 7 implies that hosts should front-load bargaining (equity options, local-content schedules, review clauses) before the offtake contract is signed. Figure 8 contrasts the enclave and embedded pathways, and Figure 9 positions the corridors by embeddedness and offtake security: India is the only corridor in the embedded-and-bankable quadrant; the Gulf and Egypt are bankable export platforms; Morocco is embedded but pre-bankable; Namibia and Chile are speculative enclaves on current evidence.

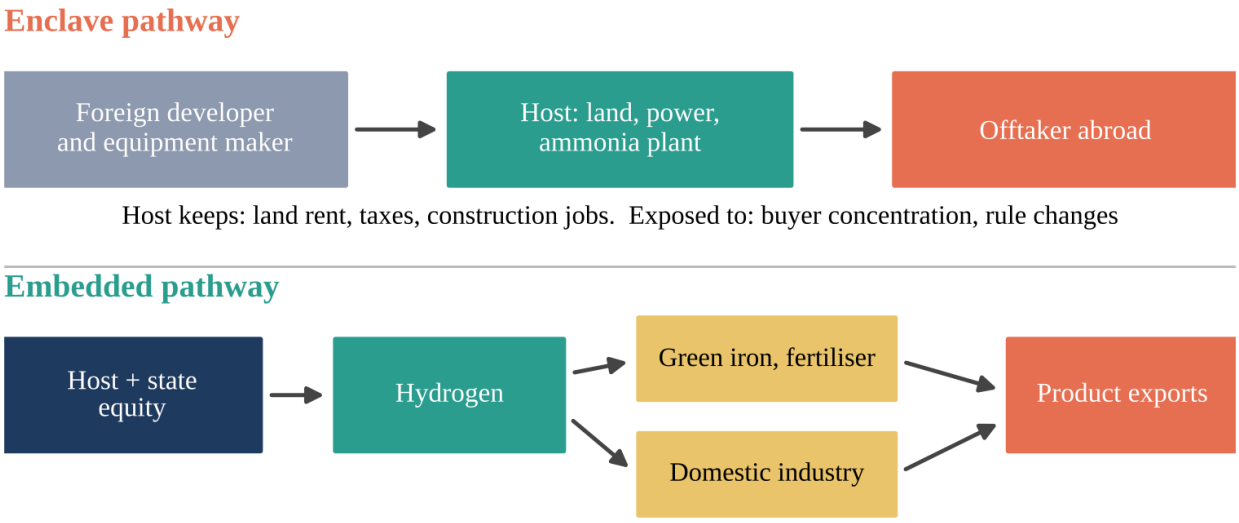


Figure 8. Enclave versus embedded export pathways (conceptual).

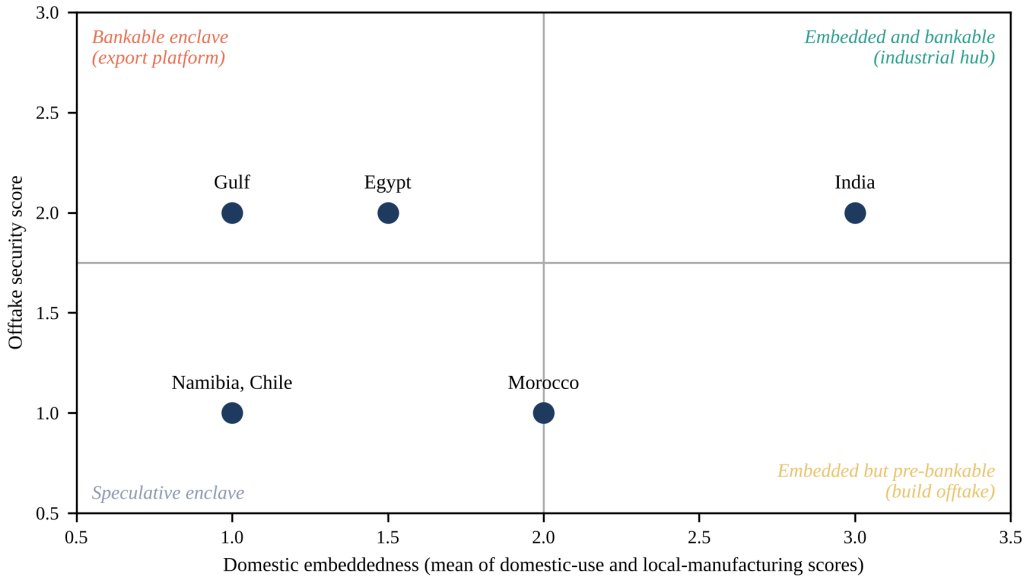


Figure 9. Portfolio matrix derived from the scorecard (author's assessment).

Table 10. Guidance for stakeholders.

Stakeholder	Strategic priorities	Principal risks
Host governments	Aggregate demand; negotiate equity options and local-content schedules before FID; anchor projects to domestic fertiliser or steel users; build certification and engineering capacity; form buyer or exporter alliances [54]	Fiscal strain from equity; land and water conflict; locked-in single-buyer terms
Developers and investors	Secure creditworthy offtake with review clauses; use local partners to bridge institutional voids [32, 35]; stage capex	Cancellation if offtake fails; political risk after sunk investment; rule changes in importing markets
Offtakers and importers	Diversify supply across corridors; support local content and safeguards to protect licence to operate; align certification with exporter regulators	Stranded contracts; reputational risk from land or water disputes
Lenders and DFIs	Use blended finance to fund host equity and early development; require safeguards and domestic-use provisions	Concentration in unbankable projects; additionality questions
Domestic industry	Contract for anchor demand early; prepare for green-product premiums	Higher input costs without premium; grid competition

Sustainability trade-offs (Table 11) matter as much as rent capture. Projects of this scale need tens of thousands of hectares, desalinated water in arid regions and new transmission and port infrastructure; Hyphen's footprint inside a national park [45] and Morocco's allocation of up to 30,000 ha per project [43] illustrate the land question, a classic energy-justice concern [37]. Where exported ammonia absorbs renewable electricity that local households or industry could use, SDG 7 may advance abroad while domestic access is unchanged.

Table 11. SDG synergies and trade-offs.

SDG	Potential synergy	Risk in enclave model
7 Clean energy	New renewable capacity; cheaper power	Power diverted from local grid and households
8 Work and growth	Construction jobs, new export base	Few permanent jobs; boom–bust cycle
9 Industry	Green iron, fertiliser, equipment plants	Only low-learning upstream stages stay
13 Climate	Displaces grey ammonia and fossil fuels	Emissions credit counted abroad; leakage
10 Inequality	Regional development in remote areas	Rents concentrate; land and water conflicts
17 Partnerships	Collective bargaining, South–South links	Dependence on importer rules and finance

5.5 Limitations

First, the scorecard is a single-coder ordinal instrument built on public sources, several of them trade press and company or government announcements that are not independently audited and change quickly. The perturbation simulation shows robustness to coding noise but does not replace independent double coding with an agreement statistic. Second, most projects are pre-FID, so employment, technology transfer and environmental outcomes are inferred from design and contract terms rather than observed; the evidence is congruent with the hypotheses but cannot establish causation. Third, price comparisons mix domestic delivered and export-oriented prices, dates and currency conversions, and omit shipping and reconversion costs. Fourth, six cases support analytical rather than statistical generalisation [40, 55]; case selection excludes other hosts, and India–Middle East and Latin America–Asia evidence is thin. Fifth, the literature base is purposive, not a systematic database search. Sixth, water, land tenure and community consent are decisive for SDG outcomes but only coarsely captured.

5.6 Future research

Five extensions are specific and feasible. (1) Independent double coding of an expanded set of at least twelve corridors (including Brazil, Mauritania and Kenya), reporting inter-coder agreement. (2) Contract-level analysis of concession and offtake terms as they are disclosed, to test H1 and H5 directly. (3) Interviews with negotiators and regulators to examine institutional capacity (H4). (4) Once projects reach FID, panel analysis of the determinants of hydrogen FDI in the manner of existing FDI studies [13]. (5) Computable general equilibrium or fiscal modelling of exchange-rate, water and fiscal impacts.

6. Conclusion

Green hydrogen export corridors can support sustainable industrialisation, but they do not do so by default. The 2025–26 shake-out shows that the scarce asset is a creditworthy long-term buyer, not sunshine, wind or land, and that this scarcity shifts rents toward offtakers, certifiers and technology suppliers. Across six corridors, host capture is highest where the state aggregates demand, holds equity and requires domestic use; India and the Gulf lead robustly, while the order of the remaining corridors depends on what decision makers value. The paper contributes a six-rent taxonomy, a transparent and stress-tested scorecard, a three-party extension of the obsolescing-bargain logic and stakeholder guidance. Hosts should bargain early, anchor projects in domestic demand, pool buyers and sellers and write safeguards into concessions; without such conditions corridors risk reproducing resource dependence under a green label, with costs to SDGs 10 and 17 even as SDGs 7 and 13 are advanced abroad.

Declarations

Acknowledgements: None declared. **Funding:** This research received no external funding. **Competing interests:** The author declares no competing interests. **Ethics statement:** The study uses only public documents and involves no human participants; ethics approval was not required. **Data availability:** No primary data were generated. All evidence comes from the public documents cited; scorecard values, rationale and the evidence log are reported in Tables 7–8 and Appendices A and C; simulation settings are stated in Section 3.5. **Author contributions (CRediT):** Nikita Rawat: Conceptualization; Methodology; Investigation; Formal analysis; Visualization; Writing – original draft; Writing – review & editing. **AI-use declaration:** Generative AI (Claude, Anthropic) was used to support literature organisation, drafting, figure and analysis code, and formatting. The author is responsible for the content and for verifying all claims and citations; no AI system is listed as an author.

Appendix A. Scoring Rationale

Table A1. Rationale for scorecard rows.

Corridor (total)	Higher-scoring features	Lower-scoring features
India (13)	State aggregation through SECI auctions; domestic fertiliser and refinery demand; electrolyser manufacturing incentive [48, 53]	Export volumes not yet operating; safeguards and grid readiness still developing [16]
Gulf (11)	Sovereign-linked equity; 30-year offtake secured at NEOM [47]	Mainly export-led; imported electrolysers; Oman cancellation shows offtake risk [15]
Namibia (9)	24% state equity and expected share of distributions above 40% [46]	Offtake not yet binding; limited local manufacturing; national-park siting; state financing constraints [45]
Morocco (9)	Large land programme with fiscal incentives; domestic fertiliser sector as potential anchor [43]	Land-concession model with limited public equity; no binding offtake reported; water pressure
Egypt (8)	Existing fertiliser base; early H2Global lot [44]	Limited equity and local manufacturing; generous incentives reduce fiscal capture
Chile / LatAm (8)	Competitive fiscal terms; stronger environmental review institutions (author judgement) [49]	Mostly pre-FID; limited domestic downstream use and public equity

Appendix B. Source Grading

Table B1. Evidence tiers.

Tier	Source type	Examples	Use
1	Legislation, official programmes, tender results	EU directives and regulations; India NGHM; Chile strategy; H2Global results	Basis for key claims
2	Intergovernmental and industry bodies	IEA; IRENA; Africa Green Hydrogen Alliance	Context and benchmarks
3	Quality business and trade press, company announcements	MEED; bne IntelliNews; Business Standard; Ecofin; Engineering News; Down To Earth; S&P Global; Air Products	Project status and prices, cross-checked
4	Aggregators and blogs	Hydrogen news aggregators	Locating primary reports only

Appendix C. Evidence Log

“Retrieved” means the item was located in a web search in November 2026 and the figure was read from the report or its summary; “Publication” means the figure is taken from the official publication and should be re-verified against the original before submission.

Table C1. Evidence log for key quantitative claims.

Claim	Source	Tier	Status
Hydrogen demand about 97 Mt (2023), under 1% low-emissions	IEA Global Hydrogen Review 2024	2	Publication
EU import target 10 Mt by 2030	REPowerEU, COM(2022) 230	1	Publication
HyDuqm (USD 6.7 bn) cancelled, Dec. 2025	MEED	3	Retrieved
About 78 African projects, many without offtake	bne IntelliNews citing EIC	3	Retrieved
Morocco land agreements, Feb. 2026; 1 Mha identified	Ecofin Agency; Reuters/pv magazine	3	Retrieved
Namibia 24% equity via SDG Namibia One; over 40% of distributions	The Namibian; Engineering News; New Era	3	Retrieved
India green ammonia auction INR 55.75/kg; range INR 49.75–64.74	Down To Earth; S&P Global; Invest India	3	Retrieved
H2Global 2024 tender about USD 1,153/t; Fertiglobe lot	Invest India; Hintco	1/3	Retrieved (price); Publication (winner)
About 8,000 t/yr commissioned in India outside subsidy	Business Standard, Nov. 2026	3	Retrieved
NEOM 2.2 GW, USD 8.4 bn, 30-year offtake	Air Products / NEOM Green Hydrogen Co.	3	Publication
NGHM 5 Mt/yr; INR 19,744 crore	MNRE	1	Publication
Grey ammonia about USD 515/t (Mar. 2025)	Down To Earth	3	Retrieved

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