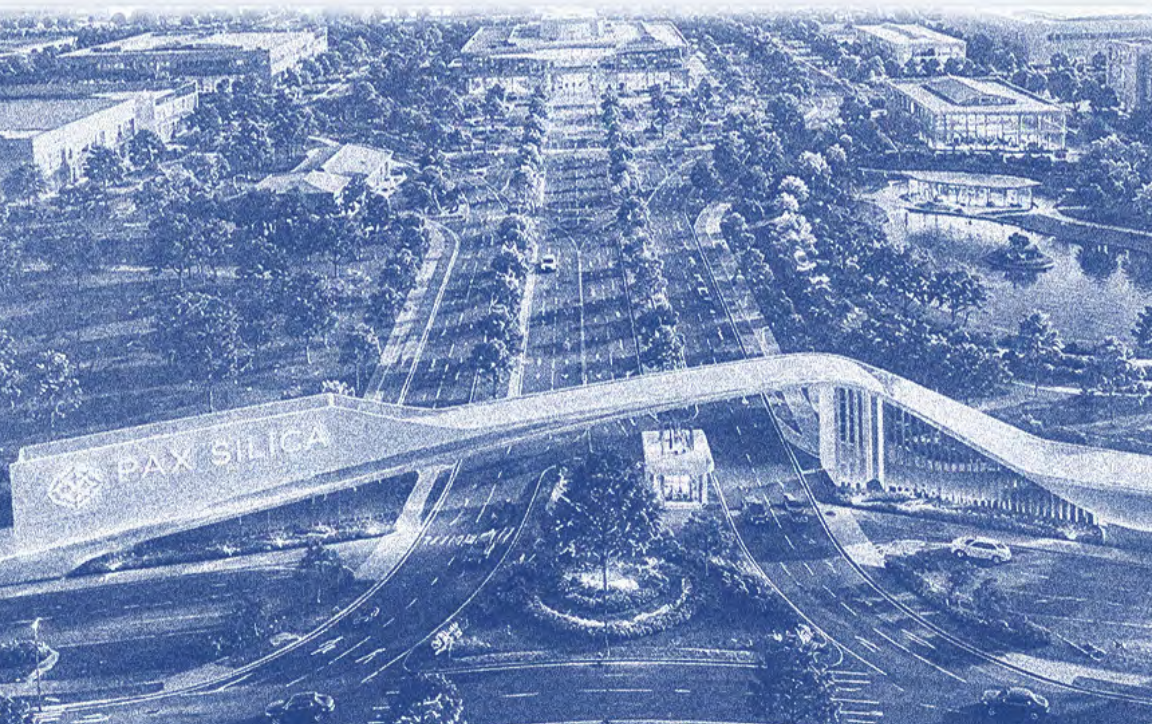


An Analytical Framework for Assessing Philippine Participation in Pax Silica

Hosting, Upgrading, and the Limits of Co-location

Edylinda Annette Balaoing-Pelkmans 

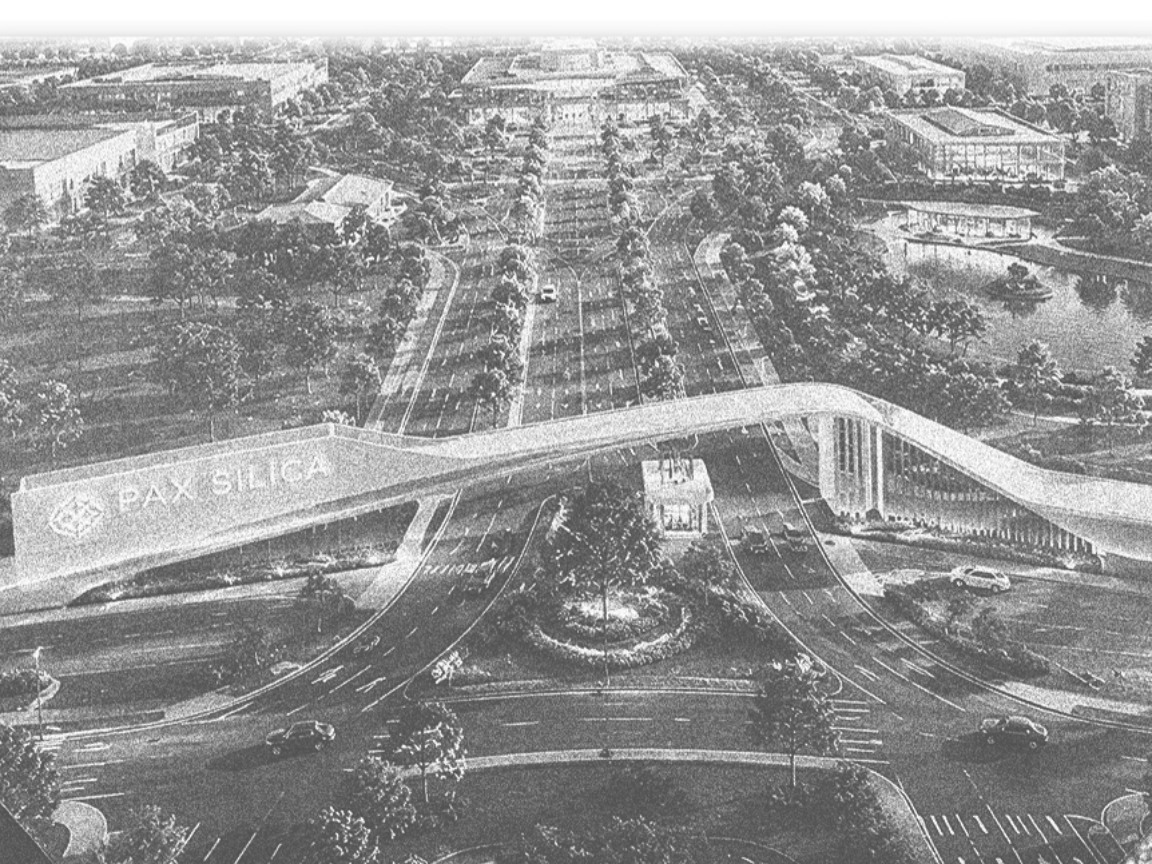


Program on Escaping the Middle - Income Trap: Chains for Change

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Cover Image Credit

"A digital illustration of the proposed Pax Silica project in New Clark City in Capas, Tarlac unveiled on May 18, 2026."

Photo courtesy of Patrick de Jesus/PTV News, <https://ptvnews.ph/bcda-debunks-myths-concerning-pax-silica-project/>

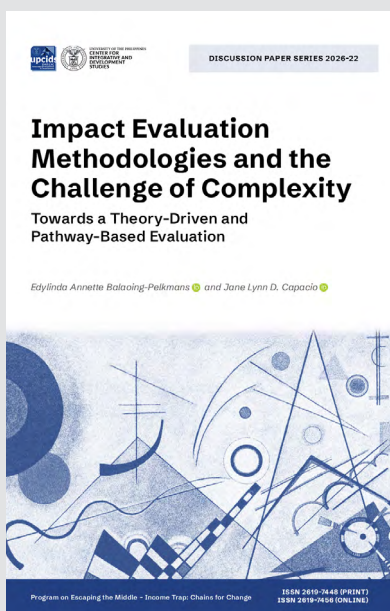
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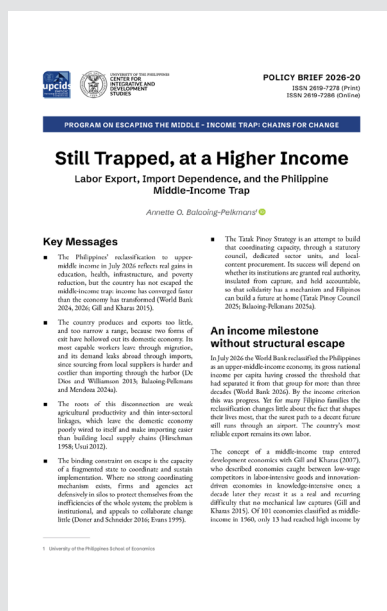
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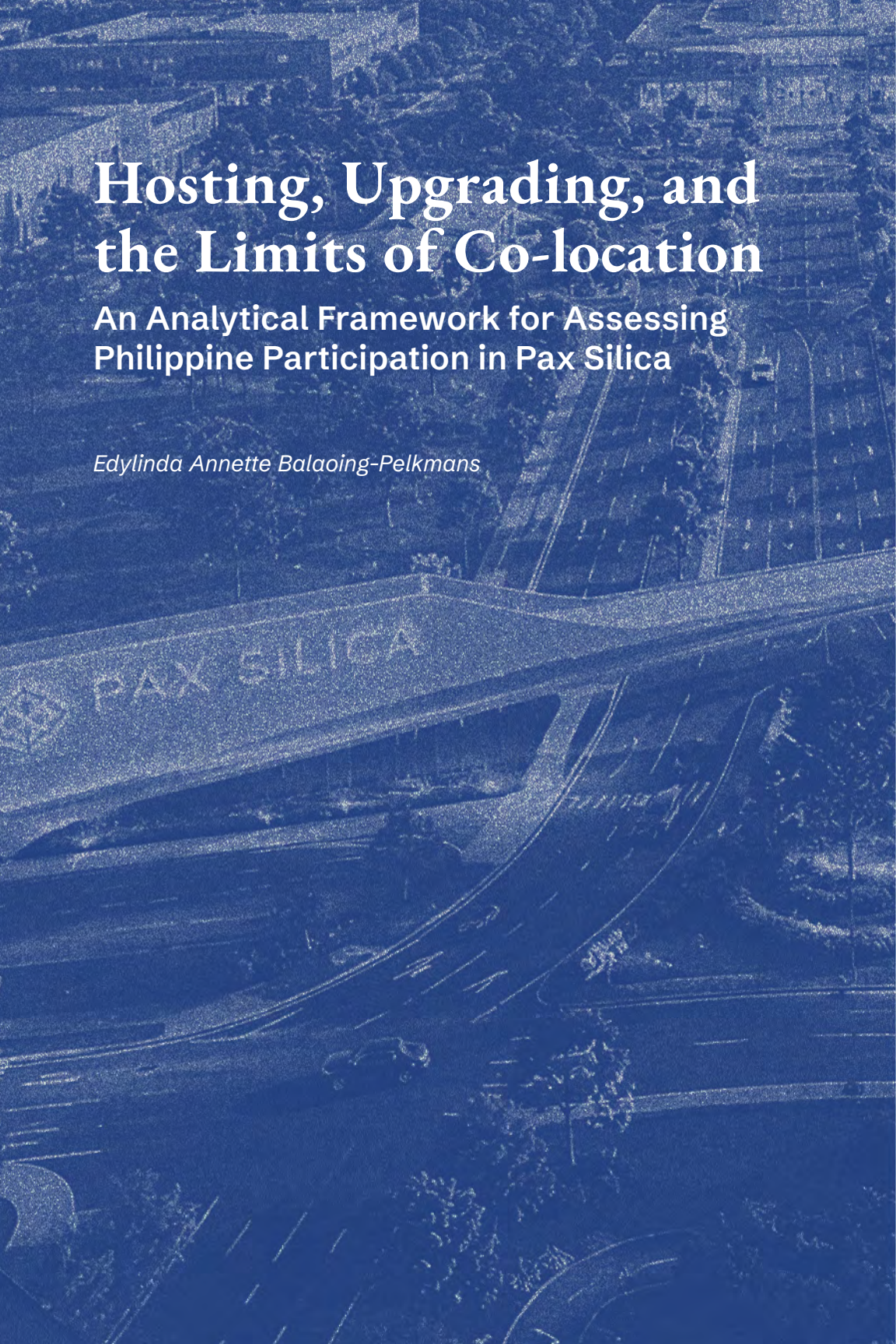
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Impact Evaluation
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POLICY BRIEF

Still Trapped, at a Higher
Income: What Decades of
Middle-Income Trap Research
Tells the Philippines, and Why
Value-Chain Reform Is the
Escape Route



Hosting, Upgrading, and the Limits of Co-location

An Analytical Framework for Assessing
Philippine Participation in Pax Silica

Edylinda Annette Balaoing-Pelkmans

Key Highlights

■ Main Argument

Co-location of lead firms at Clark does not by itself relocate the core of the semiconductor value chain. In the absence of deliberate linkage policy, what gathers in the zone is likely to be peripheral function. The binding constraint on Philippine industrial policy is the absence of a coordinating authority with the budget and the legitimacy to hold commitments, both to investors and from investors, across administrations.

■ Policy Landscape

The Philippines signed the Pax Silica Declaration in April 2026. The Declaration is a political statement, and the binding commercial framework agreement between the BCDA and a United States government agency is still under negotiation, with a provisional signing target of November 2026. No project-specific environmental impact assessment has been filed, the ancestral domain claim of the Aeta community of Sitio Sapang Kawayan remains unapproved, and the power and water supply of the zone has not been independently assessed.

■ Method

The paper is an analytical and policy-design exercise. It assembles a framework from five bodies of theory, namely global value chain governance, agglomeration and core-periphery economics, ecological economics and the theory of irreversibility, the developmental state literature, and geoeconomics. The framework is applied separately to semiconductor assembly, critical mineral processing, data center infrastructure, and corridor logistics. Benefits are counted only where they are written into enforceable instruments.

■ Findings

Assembly, testing, and packaging will deliver process upgrading almost by default, and functional upgrading only by deliberate policy design. Mineral processing promises the most and carries the risks that are hardest to reverse. Data center infrastructure presents the weakest developmental case. Corridor logistics retains its value under any political configuration. Several of the costs at stake, to watersheds, aquifers, and communities, are irreversible, and standard appraisal methods undervalue them.

■ Policy Recommendations

Investments that retain their value under any configuration of partners, namely grid capacity, water systems, corridor connectivity, engineering

skills, and supplier certification, should proceed now. Project-specific expenditure and any irreversible ecological or territorial commitment should be staged against signed investor obligations and completed assessments. Each condition should carry a documentary requirement, a monitoring indicator, and a consequence for non-attainment, and a statutory coordinator with budget authority should oversee them.

Introduction

The Philippines has taken part in electronics manufacturing for five decades, electronics now account for more than 60 percent of merchandise exports, and export values reached approximately USD 46 billion in 2025.¹ Yet the OECD concludes that the Philippines, while remaining a significant actor in the global semiconductor sector, is not strengthening its position within global value chains.² That position has persisted through several waves of investment, export growth, and policy reform, each of which was expected in its time to carry the country into the functions that determine returns and technological direction (Balaoing-Pelkmans and Mendoza 2024). It is against this record that Philippine participation in Pax Silica has to be assessed.

The debate on Pax Silica has settled into two positions with little middle ground. The government and its business-facing agencies present the initiative as a route into higher-value semiconductor, artificial intelligence, and critical minerals supply chains. Farmer organizations, Indigenous advocates, environmental scientists, and nationalist critics describe it as a further round of extraction and dispossession under an external security architecture. The gains the government expects and the risks the critics describe are both real, and a policy decision has to account for both.

A useful analysis begins from the context in which the choice is being made, that is, from the market, institutional, and coordination failures that have shaped Philippine industrialization, and then asks which arrangements would address those failures and which would leave them in place. The questions that follow concern the type of industrial upgrading that participation would bring, who would control it, what ecological safeguards would apply, and how the benefits would be distributed. These are primarily analytical questions that need sorting out before the policy implications are further scrutinized.

The stakes run in both directions, which is what makes the question difficult. Proceeding carries environmental, fiscal, and territorial risks—some of which

are permanent. Declining carries the cost of a further deferral of industrial upgrading in an economy that has seen a number of ‘catch-up ships’ sail away. The relevant comparison is therefore among industrialization pathways, each with its own distribution of gains, costs, and risks.

Method and evidentiary limits

This paper is an analytical and policy-design exercise. It does not estimate net present value and does not forecast project outcomes. The paper instead triangulates official statements, publicly available policy documents, trade and industry data, comparative cases, and the relevant theoretical literature.

One rule governs the treatment of evidence throughout. Where project documents, technical studies, or contractual provisions are not publicly available, the issue is treated as unresolved and no benefit is imputed. Technology transfer, supplier linkage, renewable supply, consent, and benefit sharing therefore enter the base case as benefits only where they are written into enforceable instruments. The rule is conservative by design, and it shapes several of the conclusions below.

Two further limits should be stated at the outset. The Philippines acceded to the Pax Silica Declaration in April 2026, and the period covered here is a matter of months, during which the project has necessarily remained incompletely specified.³ Much of what a full appraisal would require has not yet been produced, and in several instances the paper can only record that a document is absent, with nothing yet to say about what it will contain. The assessment should be read in that light, as a framework for judging what is still to come as much as a judgement on what has happened so far.

The paper is organized into eight sections. Section 2 records the status of the project, its boundary, and the evidentiary standing of the principal claims in circulation. Section 3 assembles the analytical framework and states what each body of theory predicts for the Philippine case. Section 4 applies the framework to the components of the project in turn. Section 5 sets out the counterfactual scenarios against which the project should be judged, and Section 6 records what the available evidence cannot yet settle. Section 7 converts the analysis into monitorable conditions, and the final section concludes.

Project status, boundary and evidence

The status of the principal claims

One source of difficulty in the debate is that claims of very different standing circulate side by side. A signed declaration is cited alongside a BCDA projection of investment over a build-out of several decades, and both are weighed against press reports and independent estimates of water demand as though they carried the same evidentiary weight. Each type of claim requires different treatment, and much of the disagreement in the current exchange can be traced to the failure to distinguish them. Table 1 (below) sets out the standing of each principal claim used in this paper, together with the verification that would be needed to settle it. Sources are given in the notes to section 2.3.

Table 1. Evidentiary status of the principal claims

Claim	Status	Basis	Verification needed
Philippines signed the Pax Silica Declaration, 16 April 2026	Established political fact	Official releases of both governments	Attach declaration text and any annexes
The Declaration does not itself create enforceable project obligations	Assessment of publicly available instruments	European Commission statement following consultation with the US State Department	Confirm against the full declaration text
A commercial framework agreement is under negotiation, targeted for November 2026	Reported official intention	BCDA and DTI statements to press, September 2026	Publish draft, parties, governing law and dispute resolution
Investment of 40 to 70 billion dollars	Long-run projection	BCDA projection over the full build-out	Phasing, capital expenditure breakdown, investor commitments
130,000 to 190,000 direct jobs	Long-run projection	BCDA projection	Occupational composition, automation and timing assumptions; separate job-years from permanent posts

Claim	Status	Basis	Verification needed
No exceptional legal treatment or immunity will be granted	Stated government position	Repeated BCDA and DTI statements, May and September 2026	Confirm against the framework agreement when disclosed
Water supply sufficiency	Unverified technical claim	BCDA statements to the Senate environment committee	Independent seasonal water balance including drought scenarios and downstream users
Technology transfer obligations	Not publicly specified	No disclosed contractual detail	Treat as absent in the base case until published
No project-specific environmental impact assessment filed	Reported agency confirmation, August 2026	DENR statement	Confirm current status with DENR and EMB records

Two patterns stand out from the table. The claims that carry the largest numbers, on investment and employment, are long-run projections attached to a build-out measured in decades. The claims that bear most directly on risk, on water sufficiency and technology transfer, are either unverified or not publicly specified. The distribution of evidence is therefore uneven in a particular direction. Benefits are stated as figures, while costs are discussed without the documents that would allow them to be measured.

Project boundary

A second source of confusion is scope. The term “Pax Silica” is used at once for a multilateral declaration, a broader initiative, and a proposed Philippine project node; and the three are not identical. The Clark Advanced Manufacturing Park sits within New Clark City, on land held by the Bases Conversion and Development Authority (BCDA), and within the wider Luzon Economic Corridor. Several policy initiatives frequently attributed to Pax Silica have independent legal bases and would proceed, or not, on their own terms. Table 2 (below) separates the activities that tend to be discussed under a single name, since each has a different location, a different governing instrument and a different unresolved issue.

Table 2. Activities commonly discussed under the name Pax Silica

Activity	Proposed location	Status	Principal instrument	Key unresolved issue
Semiconductor assembly, test, packaging and electronics	Clark	Proposed, composition unspecified	Zone governance and industry roadmap	Which tasks and segments, and supplier linkage
Integrated circuit design and engineering services	National, partly Clark-linked	Roadmap target	Semiconductor and electronics roadmap	Talent, intellectual property, procurement
Critical mineral processing	Likely outside Clark, near extraction sites	Policy direction	Executive Order 122 and incentive regimes	Technology pathway, energy source, ownership
Data centre infrastructure	Redirected away from Clark	Unclear	Ecozone and local approvals	Grid, water, public benefit test
Corridor logistics	Subic, Clark, Manila, Batangas	Multi-agency infrastructure agenda	Customs and transport rules	Transshipment, dual-use licensing

The separation matters for everything that follows. A judgement on one activity cannot simply be carried over to another, and an argument that is strong for corridor logistics may be weak for data centers. Section 4 returns to this point in detail.

Status as of September 2026

On the basis of the publicly available instruments reviewed for this paper, no binding project obligation has yet been created. The Declaration signed on April 16, 2026 is a political statement, a characterization confirmed by the European Commission after consultation with the United States State Department.⁴ The binding instrument would be a commercial framework agreement between the BCDA and a United States government agency. That agreement is still under negotiation, with a signing target of November 2026 that the BCDA itself describes as not fixed, and the target coincides with the ASEAN Leaders' Summit hosted in Metro Manila.⁵

The headline figures in circulation belong to a different category altogether. Investment of USD 40 to 70 billion, direct employment of 130,000 to 190,000, and exports of up to USD 200 billion are BCDA projections attached to a full build-out measured in decades, but none has yet been tied to a disclosed investor commitment.⁶

Three developments since accession are material. The first concerns jurisdiction. The government refused a United States request for the zone to operate under American law with legal protections for American personnel beyond those available to ordinary investors, and restated that refusal as recently as September 2026. Philippine officials have explained the original request as motivated by American concern over expropriation risk, a point to which section 3.4 returns.⁷ The second concerns scope. The official description of the project has narrowed considerably, from an AI-native industrial acceleration hub in April to a statement in September that no data centers will be sited at Clark, with such proposals redirected toward other ecozones.⁸ The third concerns domestic strategy. The Philippine Semiconductor and Electronics Industry Roadmap was launched in early September under an advisory council chaired by the Executive Secretary, with targets for 2030 that include raising the Philippine share of global assembly, test and packaging from four to seven percent, building an integrated circuit design sector exporting US\$2 to 3 billion annually, and reaching electronics exports of USD 110 billion.⁹

Several matters central to appraisal remain unresolved. No project-specific environmental impact assessment had been filed as of the end of August 2026.¹⁰ The ancestral domain claim of the Aeta community of Sitio Sapang Kawayan, pending since 1984 and endorsed by the National Commission on Indigenous Peoples in 1994, remains unapproved, and local officials have testified that consultation had not taken place.¹¹ Finally, the dispute over whether the zone can be supplied with power and water without displacing other users has not been settled by any publicly available engineering assessment.¹² That these three questions remain open while a signing date is already in view is perhaps the most important fact about the present stage of the project.

An analytical framework

Public discussion of a project at this stage of specification will understandably proceed on incomplete information. The more serious difficulty is the absence of an agreed structure for organizing what is known. Without such a structure, each new fact is absorbed into whichever position the reader already holds, and

the debate hardens without becoming better informed. This section assembles five bodies of theory for that purpose and states what each predicts for the Philippine case. They come from different disciplines and were developed to answer different questions. Taken together, they move the debate onto mechanisms that can be observed and monitored, and away from motives that can only be imputed.

Global value chain governance and the four types of upgrading

Gereffi, Humphrey, and Sturgeon (2005) distinguish five modes by which global value chains are governed, running from arm's length market exchange through modular and relational arrangements to captive relationships and full hierarchy. In their account, the choice among these modes is determined by three factors, namely the complexity of the transactions involved, the ease with which the relevant information can be codified and exchanged, and the competence of suppliers to receive complex information and act on it. The mode that results determines how much knowledge reaches the supplier and how much autonomy the supplier retains. Captive governance, in which a supplier depends heavily on one buyer and produces to that buyer's specifications, is efficient for both parties. But it transmits relatively little beyond process knowledge, and the cost of switching to other buyers tends to lock the supplier into the chain.

Humphrey and Schmitz (2002) supply the corresponding vocabulary of upgrading. Process upgrading raises efficiency at an existing task. Product upgrading moves the supplier into more sophisticated outputs. Functional upgrading involves taking on new functions such as design, testing or supply coordination, and chain upgrading involves entry into a different value chain altogether. The regularity that matters most for this paper is that captive relationships reliably generate process upgrading and rarely generate functional upgrading. The reason lies in incentives. The lead firm has a direct interest in the efficiency of its supplier and very little interest in the supplier acquiring the functions on which the lead firm's own returns depend.

Earlier work by this author on agricultural value chains adds a qualification (Balaoing-Pelkmans 2020). Whether a captive chain remains a trap depends a great deal on how the lead firm uses its power, and on whether lead firms, government and other social partners jointly commit to addressing the market and institutional failures that keep suppliers weak. As supplier capabilities rise,

monitoring costs fall and security of supply improves, so that the lead firm itself gains from the transition. The mode of governance is therefore partly a product of policy and partnership, and it can shift over time.

Lall (1992) adds a distinction that public discussion frequently overlooks, between production capability, the ability to operate a given technology efficiently, and innovation capability, the ability to modify and generate technology. Export volume and foreign direct investment measure neither directly. Yeung (2016) makes the complementary point through the concept of strategic coupling. Regions obtain more than footloose investment only where domestic firms and institutions acquire assets that lead firms need, since it is this mutual dependence that gives the host something to bargain with.

The framework predicts the Philippine outcome documented by the OECD and by Athukorala (2021), namely five decades of participation in electronics assembly, testing and packaging without a sustained move into the functions that determine rents and technological direction.¹³ It also disciplines the current discussion. Additional assembly capacity at Clark would represent process upgrading. That is real and it is not trivial. But it is not what the term industrial upgrading is generally taken to mean when projections are presented in public debate, and the distinction should be made explicit whenever they are.

Agglomeration, core and periphery, and why co-location is not enough

The government's implicit spatial theory is sound as far as it goes. Marshall (1890) identified three sources of gain from the geographic concentration of firms in the same industry, namely a shared pool of specialized labor, the attraction of specialized suppliers and producers of intermediate goods, and knowledge spillovers between proximate firms. Krugman (1991), and the new economic geography he developed with Fujita and Venables (1999), formalized how these forces become self-reinforcing through cumulative causation, producing a core that accumulates activity and a periphery that loses it. The BCDA's expectation that the interest of an anchor investor will draw further investors applies this logic directly, and the reported intentions of Korean, Singaporean, and Taiwanese entities to lease land within New Clark City are consistent with it.¹⁴

The difficulty is that in contemporary global production the core is defined by function as much as by geography. Advances in information and communications technology allow lead firms to disperse production stages internationally while retaining design, process know-how and coordination within their own organizational boundaries (Baldwin 2016). Firms can therefore agglomerate at Clark while the functions that constitute the core remain in Hsinchu, Seoul, Santa Clara, or Eindhoven. What forms in the zone may then be a dense cluster of peripheral functions, which is a thicker version of the existing Philippine position that would look, from the outside, very much like a departure from it.

Markusen (1996) gives this outcome a name. Among her types of industrial district, the satellite platform consists of branch plants of externally headquartered firms, clustered in one location, trading little among themselves, and with strategic decisions taken elsewhere. Satellite platforms can generate substantial employment and export value while producing weak local linkages and little indigenous innovation. The risk for Clark is therefore of an unexpected kind. A zone that fails to attract investment is a visible failure and invites correction. A zone that attracts investment and settles into a satellite platform registers as a success on every headline indicator, but the absence of upgrading may take a decade to become apparent.

How, then, are Marshallian spillovers to be secured, if proximity alone does not produce them? The answer lies in the channels through which they travel, namely local supplier relationships, the mobility of engineers and technicians between firms, and sustained links between firms and domestic research and training institutions. Each channel has institutional prerequisites that can be supplied deliberately or left absent, and at least six can be identified. The first is a technical intermediary able to diagnose domestic suppliers and certify them against the standards that locators apply. The Philippines has partial versions of such an intermediary. The Advanced Device and Materials Testing Laboratory (ADMATEL) of the Department of Science and Technology (DOST) has provided failure analysis and materials characterization to the semiconductor industry since 2013, and added nanoscale analysis equipment in 2026.¹⁵ The Electronics Product Development Center, run by the DOST Advanced Science and Technology Institute with the Electronics Industries Association of the Philippines, offers design, prototyping, and testing services.¹⁶ Their mandates, as publicly described, center on testing and prototyping services, and neither was set up to qualify domestic suppliers against the procurement standards of multinational locators. Both could nonetheless form the core of such a function if given that mandate, stable funding and the participation of industry

associations such as SEIPI. The intermediary therefore has to be built on existing foundations, and it cannot be assumed to exist already. The second is a set of shared testing, metrology and prototyping facilities accessible to domestic firms and universities as well as to locators. The third is patient finance for supplier upgrading, since the capability-intensive domestic firms identified in the *Tatak Pinoy* consultations are frequently small and lack access to long-horizon capital.¹⁷ The fourth is housing, transport and labor market infrastructure designed for workers as well as for facilities. The fifth is a set of rules that prevent the zone from consuming scarce infrastructure while surrounding communities bear the cost. The sixth is a local development compact that binds the BCDA, local governments, workers, Indigenous communities, firms, and educational institutions to a common set of obligations.

The Philippine special economic zone record illustrates what happens when these prerequisites are missing. Registered zones have sometimes extended only to the compound of a single large locator, excluding the indirect exporters and input suppliers that make up the surrounding ecosystem. Farole (2011) and the comparative zone literature find that linkage outcomes depend on deliberate design, and that the existence of a zone guarantees very little by itself. Where market failures are pervasive and the capacity of government to address them is weak, the resulting institutional voids create opportunities for the most powerful actors to create and capture value (Martí and Mair 2009). The policy question is therefore whether Filipino firms, workers and institutions will be inside the resulting cluster or merely adjacent to it. Whether lead firms locate in Clark is, in the end, the lesser question.

Irreversibility, option value and ecological limits

A distinct set of costs cannot be recovered by later policy correction, and this sets them apart from most of the risks discussed so far. A disadvantageous contract can be renegotiated. A weak agency can be strengthened. A deforested watershed, a depleted aquifer, a mined-out mountain, and a displaced community cannot be restored on any relevant policy horizon.

Standard appraisal handles such costs poorly. Arrow and Fisher (1974) and Henry (1974) established that under uncertainty, where a decision is irreversible, there is positive value in postponing commitment to acquire information. Conventional cost-benefit analysis, which discounts future costs and treats natural assets as substitutable, systematically understates this quasi-option value. Ecological economics takes the argument further. Georgescu-Roegen

(1971), Daly (1996), and Martinez-Alier (2002) argue that material and energy throughput is bounded, that natural capital cannot be indefinitely replaced by produced capital, and that ecological conflict is properly understood as a distributive conflict over who bears the costs of throughput. Ostrom (1990) supplies the institutional counterpart. Central Luzon groundwater is a common pool resource, and its sustainable use depends on rules that are locally legitimate, monitored, and adaptive.

Four dimensions organize the assessment (Schlosberg 2007). The first is distribution, which concerns who receives employment, rents and infrastructure and who bears water scarcity, land loss, livelihood insecurity, and environmental damage. The second is recognition, which concerns whether affected communities are treated as stakeholders to be consulted or as rights holders with authority under the Indigenous Peoples' Rights Act and the free, prior, and informed consent procedures of the National Commission on Indigenous Peoples. The third is participation, which concerns whether communities have access to independent technical and legal advice and the capacity to shape alternatives, beyond approving or rejecting a design already settled. The fourth is intergenerational justice, which concerns how cumulative ecological thresholds are represented when benefits accrue early and damage persists.

The recognition dimension deserves emphasis because it is so often treated as a procedural matter. Consultation cannot substitute for consent where the law requires consent. Consent obtained from communities that lack the independent technical, legal and financial capacity to assess a proposal can hardly be called meaningful. Free, prior and informed consent is an institution that allocates authority, and to describe it as a step to be completed is to misstate what it is. Legal title, for its part, settles less than it appears to. The BCDA's position rests on the public and industrial designation of the Clark site. Experience in Mindanao suggests how little such a position may resolve in practice. In Bukidnon, an agribusiness company that held legal land rights and water access still had to learn, after the Talaandig tribe had harbored its grievances for 10 years before taking concrete action, to acknowledge ancestral rights voluntarily and to settle differences through dialogue (Balaoing-Pelkmans 2020). The lesson there was that unacknowledged grievances accumulate with time, and that the cost of addressing them rises as they do.

The practical implication is a sequencing rule. Assessment, water accounting, and consent belong before irreversible commitment. The current sequence runs in the opposite direction, with a signing target set for November 2026 and no publicly available project-specific environmental impact assessment.¹⁸

Nor is the potential exposure confined to the zone. The BCDA states that no mining will occur inside the Clark site, and that mineral processing would be located closer to extraction sites in the Visayas and Mindanao. Processing capacity nonetheless generates demand for ore, wherever it is sited. Executive Order No.122 designates critical mineral projects as national priority projects with downstream processing mandates.¹⁹ The Legal Rights and Natural Resources Center estimates that the order opens approximately nine million hectares of potentially mineralized land to exploration, against roughly 790,000 hectares currently covered by large-scale mining contracts according to the Department of Environment and Natural Resources (DENR).²⁰ Indonesian experience indicates that the downstream stage carries its own burden, since nickel smelting there has been powered substantially by dedicated coal capacity.²¹

Embedded autonomy and the co-governance problem

Evans (1995) argues that effective industrial policy requires a state that is simultaneously embedded in industry, closely enough to diagnose real constraints, and autonomous from it, sufficiently to withdraw support from underperformance. Amsden (1989) and Wade (1990) document the East Asian cases in which this combination was achieved, and Mazzucato and Rodrik (2023) reformulate the discipline requirement as conditionality attached to public support.

Two observations deserve emphasis. The first is that embeddedness is a property the state cannot confer on itself by convening more consultations. A state becomes embedded when industry is willing to share information it is under no obligation to share, and that willingness belongs to industry. The second is that autonomy is similarly relational in practice. The capacity to withdraw support from a politically connected or internationally significant investor depends on whether the surrounding coalitions permit that decision to stand. Both properties are therefore jointly produced, by the state and by those with whom it deals. This is the analytical content of the co-governance principle in the Tatak Pinoy Strategy, and it explains why the principle has to be designed as a working mechanism, since an aspiration alone produces neither property.²²

Balaoing-Pelkmans (2026) documents the current Philippine position against this standard. Support systems remain fragmented across the Department of Trade and Industry (DTI), the Department of Science and Technology,

the Technical Education and Skills Development Authority (TESDA), the Commission on Higher Education (CHED), and the BCDA. Government-industry collaboration has been repeatedly interrupted by changes in administrative priority, so that firms and industry associations which invested time in curriculum design and workforce coordination saw those efforts lapse when programs changed. No single body has held budget authority together with cross-agency convening power. The advisory council operating alongside the September roadmap is the first institution to approximate the Strategic Development Unit proposed under the Tatak Pinoy Strategy. Whether it acquires real budget authority is an empirical question, and one that can be monitored as well as argued. The revision of the target for training semiconductor professionals from 2028 to 2030 is an early indication of how such targets behave when they lack budgetary anchoring.²³

The credibility problem runs in both directions, which is analytically useful. The United States request for exceptional legal protection was explained by Philippine officials as motivated by concern that American assets might be expropriated. In substance, that is a statement of doubt about whether Philippine commitments survive changes of administration. The Philippine response, that the country has a record of carrying investment projects across administrations, is a claim about precisely the institutional continuity that domestic critics also demand.²⁴ The same institutional capacity that would reassure an investor is what would allow the state to hold that investor to its obligations.

Goeconomics, chokepoints and policy space

Farrell and Newman (2019) show that states positioned at the hubs of economic networks can convert that position into coercive leverage. Miller (2022) documents why semiconductors are unusually susceptible, given the concentration of extreme ultraviolet lithography, electronic design automation software, and leading-edge fabrication among very few firms. Blackwill and Harris (2016) place such instruments within a broader account of economic statecraft.

Analytical precision requires distinguishing three mechanisms by which participation can reduce policy space, since they carry different evidence requirements and call for different remedies. The first is supply chain dependence, meaning reliance on external lead firms, equipment, finance, or export markets, which is descriptive and measurable. The second is formal

legal restriction, meaning treaty terms, export control provisions, licensing conditions, or contractual clauses, which is documentary and, for this project, currently undisclosed. The third is informal political discipline, meaning pressure arising from alliance expectations, security narratives, market access, or future investment decisions, which is inferential and observable only through its effects. Claims about reduced Philippine autonomy should state which of the three mechanisms is at issue.

The Philippines is a desired partner because of a combination of attributes, none of which would suffice on its own. Its location makes it a buffer in relation to China. It has an established semiconductor base in assembly, testing, and packaging. It holds nickel resources that could supply processing for United States supply chains. Moreover, the current Marcos administration has been receptive to the initiative. Taken separately, each of these attributes can be found elsewhere or carries limited weight, but taken together they make the country an attractive partner. Most elements of the bundle, however, concern location, resources, and political alignment, and few concern capabilities that the network would find hard to replace. This returns the analysis to functional upgrading.

A further distinction concerns durability. The underlying demand is structural, since chips, critical minerals, and processing capacity outside the People's Republic of China will be required under any plausible political configuration, the digital economy, and the energy transition alike. The particular coalition, its financing vehicle, its policy branding, and its contractual arrangements are considerably less durable. Pax Silica has no secretariat, no control lists, and no treaty basis, with its funding commitments depending on future action by the United States Congress.²⁵ The asymmetry that follows is the material policy risk. Vernon (1971) described an obsolescing bargain in which the leverage of the host rises once the investor's capital is sunk, since the investor can no longer credibly threaten to leave. In the configuration now emerging, the order of commitment is reversed. Project-specific public infrastructure is sunk early and locally, while investor commitment remains mobile until construction begins. The host sinks first, and the bargain obsolesces in the investor's favor.

The question of parallel membership in the China-led World Artificial Intelligence Cooperation Organization belongs here, and it illustrates the three mechanisms well. No formal legal restriction on dual membership has been identified in the publicly available instruments, but dual membership exists in practice. A draft State Department communication reported in August 2026 indicated that Pax Silica membership was not considered compatible with

participation in initiatives whose expectations conflict with its own, which is a form of informal political discipline and carries no treaty obligation.²⁶ To frame the response as a binary choice between blocs is analytically unhelpful. The relevant concept is portfolio diversification across investors and finance, export markets, technology partners, equipment and standards ecosystems, research collaborations, offtake arrangements, and the domestic capabilities that reduce dependence irrespective of partner. Strategic autonomy in this sense has to be built over time, and a declaration can do little to supply it.

Hosting and upgrading as responses to market failure

The five bodies of theory can be drawn together by returning to the market, institutional and coordination failures with which the introduction began. Earlier work on inclusive business models in Philippine agriculture distinguished two ways in which private actors respond to such failures (Balaoing-Pelkmans 2020). A negative approach is geared primarily to eliminating or reducing the adverse effects of market failures on the actor's own interests. A positive approach seeks to build mechanisms, create incentives and foster conditions that make markets work better for all participants. The terms carry no moral connotation here. They describe the scope of the response, and firms in either category may be acting entirely rationally.

For the purpose of exposition, we assume that a hosting arrangement relies largely on negative approaches, since lead firms address the failures that impinge on their own operations and leave the rest to others. An upgrading bargain, by contrast, combines investor obligations with public action designed to address the same failures more broadly. Table 3 (below) lists the principal failures relevant to the Clark project and indicates the extent to which each arrangement would address them. The assessments are illustrative and are intended to show the structure of the argument.

Table 3. Market and institutional failures and the extent to which hosting and upgrading arrangements address them

Market or institutional failure	Hosting arrangement	Upgrading bargain
Knowledge spillovers from lead-firm know-how	Partly, through process knowledge within captive relationships	Largely, through defined engineering functions and shared facilities
Supplier development as a coordination failure	Partly, where locators qualify suppliers for their own needs	Largely, through supplier mapping, certification and patient finance
Skills formation as a public good	Partly, through firm-specific training	Largely, through co-financed programmes and retention pathways
Information asymmetries on terms, incentives and fiscal cost	Largely unaddressed	Largely, through disclosure and fiscal impact statements
Negative externalities in water, power and discharge	Partly, through firm-level compliance	Largely, through cumulative assessment, water balances and additionality
Territorial rights and consent	Partly, through reliance on legal title	Largely, through a rights-holder process with independent advisers
Credibility of commitments across administrations	Unaddressed	Partly, and only with a statutory coordinating authority

Two features of the table deserve comment. The first is that even the upgrading bargain addresses the failures only partly, unless public action accompanies investor obligations. Training is a public good in this setting, since firms that invest in workers they may lose to competitors or to overseas labor markets will underinvest, and supplier certification has much the same character. Fully addressing these failures requires the participation of government, which both finances the public goods and provides the regulatory framework within which obligations can be enforced. The second is that the failure of credibility across administrations is resolved by neither arrangement on its own. It is the one failure that no contract can cure, and it points directly to the institutional constraint set out in section 3.4.

The failures listed in Table 3 together form a systemic, or so-called wicked, problem. Because they are interrelated, correcting some while leaving others in place offers no assurance of improvement, since scarce resources spent on partial reforms may later be neutralized by the problems left unresolved. A zone that acquires world-class facilities while coordination, credibility and consent remain unresolved would be an instance of exactly that risk.

Applying the framework to the components

Why should it matter whether Pax Silica is treated as one investment or several? The most consequential analytical error in the current debate is precisely the treatment of the project as a single investment, to be accepted or rejected whole. It covers activities with different employment profiles, resource intensities, spillover potential, and geopolitical exposure, and an argument that holds for one may fail for another. Each subsection below therefore states the developmental opportunity, the baseline risk, the information required, and the conditions for proceeding.

Semiconductor assembly, testing, packaging and electronics

This component builds on existing capability. Philippine electronics exports reached approximately USD 39 billion in 2024 and USD 46 billion in 2025, and account for more than 60 percent of merchandise exports.²⁷ The governance framework in section 3.1 predicts that expansion here will deliver process upgrading, and there is little reason to expect more without deliberate intervention.

Assembly, testing, and packaging are, however, far from homogeneous, and treating it as uniformly low in value would be an error of its own. Advanced packaging, test development, reliability engineering, failure analysis, substrate and interposer work, chiplet integration, and certain design-support functions carry different knowledge content and face different entry barriers from conventional back-end assembly. The relevant question is which segments, tasks and capabilities are actually envisaged at Clark, but that question has not been answered publicly. In its absence, the baseline risk is that the composition defaults to the tasks the country already performs, since those are the tasks

for which Philippine suppliers are already qualified and for which lead firms already have Philippine partners.

The adjacent opportunity deserves more attention than it has received. The information technology and business process management sector already performs software engineering, cloud operations, cybersecurity, analytics, and engineering services at scale. Consultations under the Tatak Pinoy Strategy produced indicative domestic value added ranges for several of these subsectors substantially higher than those associated with assembly work, although those figures require validation.²⁸ Servicing semiconductor and artificial intelligence clients located in the zone is a plausible route to functional upgrading, and one that does not require the country first to acquire fabrication capability. It builds, moreover, on capabilities that Filipino firms accumulated largely on their own, through years of learning and adaptation under fragmented institutional support.

Critical mineral processing

The case for domestic processing is strong in principle. The Philippines is the world's largest exporter of nickel ore. Shipment-level research covering April 2020 to late 2024 found that 92 percent of recorded Philippine nickel ore shipments in that period went to the People's Republic of China, and Philippine officials have cited the resulting concentration as a rationale for participation.²⁹ E.O. No. 122 directs the establishment of downstream refining and processing capability.³⁰ The logic is familiar from every resource-exporting economy that has tried to capture more of the value of what it takes from the ground.

Indonesian experience provides the most instructive comparison, and it complicates the case in ways that deserve careful attention. Following the reimposition of a full nickel ore export ban in January 2020, the value added of Indonesian nickel production rose from approximately USD 1.4 billion in 2020 to approximately USD 34.8 billion in 2023. That figure measures value added in production, but it says little about income retained domestically. Ownership and control tell a different story. Estimates vary with the measure used, distinguishing ownership from management and refining from processing, and with the date of assessment. They converge nonetheless on the finding that Chinese firms control or manage the substantial majority of Indonesian processing capacity, with recent assessments ranging from more than half under direct Chinese management with a further quarter in Chinese joint ventures, to approximately three quarters of refining capacity

under Chinese control, including through third-country affiliates.³¹ Output, moreover, has remained concentrated at the lower-value stages of nickel pig iron and ferronickel. Indonesia succeeded in moving processing onshore. Whether it succeeded in capturing the value of that processing is a separate question, and the evidence on it is mixed at best.

The conceptual point can be stated simply. Domestic processing is an activity category. Domestic value capture is an outcome, and it has to be measured. The difference between the two is the sum of wages and skills acquired, local procurement, taxes and royalties net of incentives, domestically accruing profits, and reproducible technological capability, less public subsidies and less environmental and social costs. Each term corresponds to a policy instrument. Wages and skills correspond to occupational reporting and training commitments. Local procurement corresponds to phased supplier development plans and procurement disclosure. Fiscal returns correspond to the publication of effective tax rates after incentives and infrastructure support. Ownership corresponds to the disclosure of equity, debt claims, intellectual property and offtake rights. Technological capability corresponds to defined deliverables, which a general clause on technology transfer cannot supply. Resource costs correspond to polluter-pays provisions, environmental bonds and cost-reflective tariffs.

The processing pathway also requires specification. Nickel pig iron, ferronickel, mixed hydroxide precipitate, precursor materials, cathode active materials, and recycling differ in technological content, energy intensity, emissions profile, and market position. A commitment to processing that does not specify the pathway commits to very little. And the upstream implication set out in section 3.3 applies here with full force, since processing demand can induce the expansion of mining, with consequences that cannot be reversed.

Data center infrastructure

This component is analytically distinct and, on the available evidence, presents the weakest developmental case. The reason lies in the ratio of scarce inputs to local employment and capability. The Virginia Joint Legislative Audit and Review Commission reports that industry representatives describe a typical facility of 250,000 square feet as employing roughly 50 full-time workers, about half of them contractors, while construction peaks may involve approximately 1,500 workers over 12 to 18 months.³² Lawrence Berkeley National Laboratory, in work produced for the United States Department of Energy, estimates that

data centers consumed about 4.4 percent of total United States electricity in 2023 and projects between 6.7 and 12 percent by 2028, with a subsequent update estimating 11.8 percent by 2030 within a range of 9.5 to 15.3 percent.³³ The Virginia employment evidence is specific to its jurisdiction and should be read as illustrative, since Philippine facilities may differ. The electricity trajectory is the more general finding, and the more consequential one.

It may be objected that the Philippines already hosts data centers, and that Philippine digital consumption itself generates resource demand elsewhere. Both points are accurate, but neither settles the allocation question. What matters is the opportunity cost per unit of scarce electricity, water, land, and public infrastructure, measured against the alternative uses of the same resources. In a power system with high electricity prices by regional standards, the burden of proof on that comparison should be demanding.

A public benefit test for any redirected proposal would therefore require several things. It would require additional renewable generation, as distinct from contractual claims on existing supply, which in turn entails attention to the hourly and locational matching of supply and demand, since annual certificates alone do not ensure that new demand is met by new clean supply at the hours and places where it arises. It would also require disclosure of water use, financing arrangements for grid upgrades, a transparent assessment of the impact on tariffs, demand response obligations, and defined commitments on local technical capability.

The statement that no data centers will be sited at Clark does not close the question, since proposals have been redirected to ecozones where scrutiny has so far been lighter.³⁴ Competition among ecozones for such proposals carries a familiar risk. Each zone, acting on its own, has reason to offer lighter terms in order to secure the investment, while all zones together, and the grid they share, bear the cumulative cost.²⁵

Corridor logistics

The Luzon Economic Corridor, connecting Subic, Clark, Manila, and Batangas, is the component least discussed and the most tractable. Its benefits are not specific to Pax Silica. Improved freight connectivity across Central Luzon would serve domestic manufacturers, agricultural exporters and any future investor regardless of origin, and it therefore belongs among the investments that remain justified if the political configuration changes.

Implementation nonetheless requires regulatory work that has not been completed. Transshipment under the Customs Modernization and Tariff Act is confined to a single customs district, while the corridor spans several. Proposals exist for a customs administrative order establishing a transshipment corridor and for an executive order designating the freeports as transshipment hubs, but neither has been issued.³⁵ Separately, the Strategic Trade Management Act provides the licensing architecture for dual-use goods, and no zone-specific schedule has been published indicating which categories of equipment and inputs fall under that regime.³⁶ Writing these rules before the first shipments arrive is a low-cost administrative action with high returns. It is also, less visibly, the point at which jurisdictional effects may arise in practice, even where no exceptional legal treatment has been granted.

The counterfactual

Against what, then, should the project be judged? Assessment requires a comparator, and declining this project is not equivalent to declining industrialization. Four scenarios frame the relevant comparison. Table 4 (below) sets out the principal risk of each and what would need to be evaluated in order to judge it.

Table 4. Counterfactual scenarios

Scenario	Description	Principal risk	What to evaluate
Status quo continuation	Existing assembly, test and packaging expands incrementally	Continued functional lock-in	Export growth, domestic value added, wage and supplier upgrading
Participation without enforceable conditions	Anchors and infrastructure proceed before developmental obligations bind	Satellite platform formation, fiscal and resource exposure, weak spillovers	Probability-weighted benefits against irreversible and contingent costs
Participation with an enforceable bargain	Investment proceeds against phased obligations and independent monitoring	Enforcement failure	Whether institutional capacity can sustain conditionality
Domestic diversification	Skills, supplier, logistics and research investments proceed irrespective of the agreement	Slower capital inflow	No-regret investment and domestic capability accumulation

The four scenarios are not mutually exclusive, and the relationship between the third and the fourth deserves particular attention. The investments contained in the domestic diversification scenario, in skills, supplier capability, logistics, and research, retain their value under every configuration of partners, and they would strengthen the Philippine position in any negotiation, including this one. That is why the sequencing recommendation in section 7 distinguishes them from project-specific exposure. The second scenario, participation without enforceable conditions, is the one most likely to emerge by default, since it requires no decision beyond the signing itself. It is also the scenario in which the satellite platform outcome described in section 3.2 becomes most probable.

Limits of the available evidence

Several questions cannot yet be answered on the available evidence. Recording them precisely is more useful than resolving them prematurely, since each marks a point at which the analysis above could change once the relevant documents are produced.

■ Lead responsibility

Implementation involves the BCDA as landowner and implementer, the DTI as signatory and investment promoter, the Department of Economy, Planning and Development (DepDev) in a coordinating role, and the advisory council chaired by the Executive Secretary. Lead responsibility for delivery has not been unambiguously assigned. The comparative literature indicates that this assignment matters more than the content of any single plan, since a plan without an owner tends to be implemented only where it coincides with the separate priorities of each agency.

■ Jurisdiction

The government has refused exceptional legal treatment within the zone. Whether comparable effects arise through technical instruments, including bonded manufacturing rules, dual-use licensing, and re-export control obligations attached to imported equipment, will be settled in the drafting of those instruments. It is unlikely to be settled in the framework agreement itself, which is why the drafting deserves at least as much public attention as the signing.

■ Hedging

No formal prohibition on dual participation has been identified in the publicly available instruments, and precedent for dual membership exists.

The constraint is the stated expectation of the sponsoring state, and its force will depend on how far that expectation comes to be backed by consequences.

■ **Water**

The BCDA states that the zone will rely on harvesting, storage, treatment, and recycling, without groundwater extraction. No independently verified water balance covering seasonal variation, drought conditions, and downstream users has been published. Surface harvesting at scale reduces downstream availability whether or not groundwater is drawn, so that the absence of groundwater extraction does not by itself settle the question.

■ **Employment composition**

Increasing automation in advanced manufacturing raises the possibility that projections based on earlier generations of electronics assembly overstate direct job creation. Projections should state their automation assumptions, and should separate job-years during construction from permanent positions during operation.

■ **Technology transfer**

No publicly available document specifies obligations in enforceable terms. Under the rule stated in section 1.1, transfer is therefore treated as absent in the base case, and it will remain so until the relevant provisions are published.

■ **Sequencing**

Whether the November 2026 signing can be deferred pending completion of environmental, social, and security assessments is a political decision, and no legal constraint fixes the present date. The analysis in section 3.3 indicates that deferral carries positive option value under uncertainty, and that this value is greatest where commitments are hardest to reverse.

Conditions, indicators and consequences

Recommendations stated as obligations without consequences tend, over time, to become ceremonial. They are cited in speeches and absent from budgets. Table 5 (below) therefore states each condition together with its minimum documentary requirement, a monitoring indicator, and the consequence of

non-attainment. The conditions are stated as requirements for proceeding. They take no position on whether the project should proceed, and they are framed so that proponents and critics alike can test them against the same evidence.

Table 5. Conditions, indicators and consequences

Condition	Minimum documentary requirement	Monitoring indicator	Consequence if unmet
Environmental and water safeguards	Cumulative environmental impact assessment covering zone, energy, water and induced extraction; seasonal water balance with drought scenarios; independent review	Published annual withdrawals, recycling rates, discharge quality, downstream effects	No construction phase approval, or suspension
Community rights	Documented rights-holder process with independent advisers and benefit-sharing terms	Public compliance reporting subject to lawful confidentiality	No land transfer, permit or disbursement
Local supplier development	Baseline supplier map and phased development plan	Local procurement by category, supplier certifications, contract awards	Reduction or withholding of incentives
Technology and skills	Defined engineering functions, training, equipment access and research deliverables	Occupational data, training completions, research spending, local technical roles	Milestone-based incentives and clawbacks
Fiscal value	Published fiscal impact statement	Effective tax rate after incentives, subsidy value, public infrastructure cost	Legislative or audit review
Investor commitment	Binding capital expenditure schedule and performance bond	Actual capital expenditure, employment, exports, local procurement	Staged or paused public infrastructure spending

Condition	Minimum documentary requirement	Monitoring indicator	Consequence if unmet
Exit and remediation	Asset ownership, decommissioning and environmental liability terms with escrow	Fund adequacy and periodic audit	Permit renewal conditional on compliance
Coordination	Statutory coordinator with budget authority and reporting duty	Budget execution, quarterly public dashboard	Mandatory legislative review or institutional redesign

Defining technology transfer

The term technology transfer requires operational content, since without it the term reduces to a clause with no enforceable meaning. Defined as a package of observable capabilities, it comprises training in specified engineering functions; access to process development and test development activities; joint research projects with stated rules on publication and intellectual property; access to equipment and metrology facilities; supplier qualification assistance; licensing or know-how arrangements where commercially feasible; a locally staffed engineering center with defined functions; and progression targets that carry personnel from production support toward process engineering, test engineering, design services and research. Each element can be observed, which, in turn, can be tied to a milestone. Defined in this way, technology transfer becomes a phased target against which performance can be reported year by year.

Sequencing

The distinction developed in section 5 yields a simple sequencing rule. Investments that retain their value under any configuration of partners, namely grid capacity, water systems, corridor connectivity, engineering skills and supplier certification, should proceed now. These are no-regret investments in the proper sense, since the country is better placed with them whatever becomes of Pax Silica. Expenditure specific to a single project, and any irreversible ecological or territorial commitment, should be staged against signed investor obligations and completed assessments. Deferral, where it is warranted, should apply to the second category and leave the first untouched. A country that builds its grid, its water systems and its engineering workforce while it negotiates will also be negotiating from a stronger position.

Conclusions

The Philippine debate on Pax Silica has been conducted, for the most part, at the wrong level of aggregation. Semiconductor assembly, mineral processing, data center infrastructure and corridor logistics are different propositions with different costs, and once they are separated several conclusions change. Corridor logistics, together with the skills and supplier investments that accompany it, retains its value under any political configuration. Data center infrastructure presents the weakest developmental case on the evidence available. Mineral processing promises the most and carries the risks that are hardest to reverse. Assembly, testing, and packaging will deliver process upgrading almost by default, and anything beyond that only by deliberate policy design.

The theoretical argument of the paper is that co-location does not by itself relocate the core. Agglomeration economies are real, and the government is right to expect that an anchor investor will attract others. What agglomerates in the absence of deliberate linkage policy, however, is peripheral function, and the satellite platform that results can register substantial employment and export value while generating little indigenous capability. The channels through which spillovers travel can be identified, and whether they are built or neglected is a matter of policy choice.

The institutional argument is that the binding constraint lies elsewhere than in the quality of Philippine analysis or the strength of Philippine ambition. The country possesses considerable analytical and policy-design capacity, as the semiconductor roadmap and the Tatak Pinoy Strategy both demonstrate. What it lacks is a coordinating authority with the budget, statutory foundation, and legitimacy to hold commitments across electoral cycles. That constraint bears equally on the government's ability to deliver its promises to investors and on its ability to hold investors to theirs.

What does the present stage of the project say about the prospects of converting participation into capability? It is too early to say with confidence. Much of what would settle the question has not yet been produced. No investor commitment has been disclosed and no environmental impact assessment has been filed. The communities of Capas, for their part, have yet to be consulted. Left to itself, the present polarization is most likely to produce a commitment made under time pressure, without the conditions that would make it developmentally worthwhile. The conditions set out in section 7 are, for the most part, conditions that both camps in the current debate could

accept. Assembling a constituency for them is the immediate task, and it is one to which the academic community is well placed to contribute.

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Endnotes

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