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BEYOND SUBSIDIES: WHY REGULATORY EXECUTION WILL DETERMINE THE SUCCESS OF INDIA'S SEMICONDUCTOR MISSION

Abir Chattaraj¹

I. ABSTRACT

Semiconductors have emerged as strategic assets at the intersection of economic competitiveness, technological sovereignty, and national security, prompting governments worldwide to adopt extensive industrial policies to strengthen domestic manufacturing capabilities. India responded through the Semicon India Programme by committing substantial fiscal incentives to establish an indigenous semiconductor ecosystem. This article argues, however, that while financial subsidies are necessary to attract initial investment, they are insufficient to ensure the long-term success of India's semiconductor mission. The central thesis advanced is that regulatory execution – rather than fiscal support alone will ultimately determine whether India succeeds in establishing a globally competitive semiconductor industry. The study employs a doctrinal legal methodology supplemented by comparative policy analysis and regulatory governance analysis. It examines the legal and institutional frameworks governing land acquisition, environmental approvals, water and power security, labour regulation, customs administration, technology transfer, export controls, and intellectual property protection, while comparing India's approach with those of Taiwan, South Korea, Japan, the United States, the European Union, and China. The analysis demonstrates that contemporary semiconductor competition has evolved beyond subsidy races towards institutional capacity, administrative predictability, and effective regulatory coordination. As an original analytical contribution, the article proposes a Regulatory Execution Index (REI), a diagnostic framework designed to assess semiconductor readiness by evaluating nine critical dimensions of regulatory performance and identifying execution bottlenecks that constrain industrial development. The article concludes that India's comparative advantage will

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depend less on increasing financial incentives and more on ensuring timely regulatory clearances, infrastructure readiness, legal certainty, coordinated Centre–State governance, and robust protection of technology and intellectual property. Accordingly, execution-focused governance reforms should become the principal determinant of India's long-term semiconductor strategy.

II. KEYWORDS

Semiconductor Mission, Regulatory Execution, Special Economic Zones, Industrial Policy, India.

III. INTRODUCTION

Advanced semiconductors now sit at the base of the world economy in much the way that energy supplies and the financial system do. What changed in the early 2020s was not the importance of the technology but the political reading of it. When pandemic-era disruptions exposed how few places on earth could actually fabricate leading-edge chips, the largest economies stopped treating the device as an ordinary traded good and began treating it as an instrument of statecraft. India joined that contest in December 2021. In that month the Union Cabinet cleared the Semicon India programme and committed ₹76,000 crore to the creation of a domestic semiconductor and display ecosystem. The chosen levers were overwhelmingly fiscal grants of up to fifty per cent of project cost for silicon and display fabrication, parallel support for compound-semiconductor and assembly plants, and a Design Linked Incentive layered on top.

Those bets have produced visible results. Micron's assembly, test and packaging plant at Sanand, sanctioned in June 2023 at a capital cost of ₹22,516 crore with the customary fifty-per-cent fiscal backing, began commercial production in February 2026². In February 2024 the Cabinet approved, in a single sitting, a Tata Electronics–Powerchip fabrication facility at Dholera (₹91,000 crore, 28-nanometre process, 50,000 wafer starts per month), a Tata

² Prime Minister's Office. (2026, February 28). Prime Minister inaugurates Micron Technology's semiconductor ATMP facility in Sanand, Gujarat [Press release]. Press Information Bureau, Government of India. <https://www.pib.gov.in/PressReleasePage.aspx?PRID=2233998>

assembly unit at Morigaon in Assam, and a CG Power–Renesas plant at Sanand; Kaynes Semicon followed in September 2024. By May 2026 the tally stood at twelve sanctioned projects and roughly ₹1.64 lakh crore of committed investment.

This article does not dispute that the subsidy was a sensible, and likely unavoidable, first move. The thesis it advances is narrower and, I think, more demanding: over the coming decade the variable that will separate success from disappointment is regulatory execution—the capacity of the state to supply land, water, power, statutory clearances, trade facilitation and legal certainty at the tempo and the reliability that semiconductor capital insists upon. I develop the case in three steps. The first is that subsidy has become a universal instrument and, for that reason, no longer differentiates one destination from another. The second is that India’s particular risk profile is governed by regulatory and institutional friction rather than by any shortage of capital. The third is that closing those gaps calls for a defined set of legal and governance reforms, reinforced by a mature corporate-affairs and government-relations practice.

A. Research Objectives

This article seeks to examine the determinants of long-term success in India's semiconductor industrial policy beyond the provision of fiscal incentives. Specifically, the study pursues the following research objectives:

1. To examine whether regulatory execution, rather than fiscal subsidy alone, constitutes the principal determinant of successful semiconductor ecosystem development in India.
2. To analyse the legal and regulatory frameworks governing critical execution variables including land acquisition, environmental approvals, water and power security, labour regulation, customs administration, technology transfer, export controls, and intellectual property protection and evaluate their implications for semiconductor manufacturing.
3. To comparatively assess India's semiconductor regulatory framework against leading semiconductor jurisdictions, namely Taiwan, South Korea, Japan, the

United States, the European Union, and China, in order to identify best practices and institutional lessons.

4. To propose a Regulatory Execution Index (REI) as a structured framework for evaluating semiconductor readiness by measuring regulatory performance across key execution dimensions.
5. To recommend legal, regulatory, and governance reforms capable of strengthening India's semiconductor ecosystem through improved regulatory coordination, institutional capacity, and execution-focused policymaking.

B. Research Questions

The present study seeks to answer the following research questions:

1. Can fiscal subsidies alone secure India's long-term competitiveness in the global semiconductor industry, or is effective regulatory execution the more decisive determinant of sustainable success?
2. Which legal, regulatory, and institutional factors most significantly influence the successful implementation of India's Semiconductor Mission and the development of a globally competitive semiconductor ecosystem?
3. What lessons can India derive from the regulatory and governance frameworks adopted by leading semiconductor jurisdictions, including Taiwan, South Korea, Japan, the United States, the European Union, and China?
4. How can a structured framework such as the proposed Regulatory Execution Index (REI) assist policymakers in evaluating semiconductor readiness and guiding future legal and regulatory reforms?

C. Research Methodology

The present study adopts an interdisciplinary legal research methodology appropriate to the intersection of law, public policy, economics, and regulatory governance that characterises contemporary semiconductor industrial policy. A pluralist methodological approach has been adopted because no single research method is sufficient to evaluate the legal, institutional, and governance dimensions of India's Semiconductor Mission.

First, the study employs doctrinal legal research to examine the statutory and regulatory framework governing semiconductor manufacturing in India, including laws relating to land acquisition, environmental regulation, labour, customs administration, export controls, technology transfer, and intellectual property. The doctrinal analysis evaluates the legal architecture that shapes the establishment and operation of semiconductor manufacturing facilities.

Secondly, the article adopts a comparative policy analysis by examining the semiconductor governance frameworks of Taiwan, South Korea, Japan, the United States, the European Union, and China. This comparative approach identifies international best practices and assesses their relevance to India's evolving semiconductor ecosystem.

Thirdly, the study undertakes regulatory and institutional analysis to evaluate how administrative procedures, regulatory coordination, and institutional capacity influence implementation outcomes. Particular emphasis is placed on regulatory execution, recognising that procedural efficiency and governance quality significantly affect investor confidence and project implementation.

Finally, selected comparative case studies are utilised to illustrate how different jurisdictions have combined fiscal incentives with regulatory governance to develop competitive semiconductor industries. Throughout the analysis, verified empirical evidence derived from authoritative primary and secondary sources is distinguished from the author's analytical interpretations. This integrated methodological framework enables the paper to examine not only the legal foundations of India's Semiconductor Mission but also the governance mechanisms necessary to ensure its long-term effectiveness.

D. Literature Review

Three bodies of work frame the inquiry, and a fourth observation cuts across them. The first concerns the economics of semiconductor industrial policy. Bown and Wang, writing

in the *Journal of Economic Perspectives*, trace the sector's political economy and document a decisive contemporary turn toward intervention one that now bundles manufacturing subsidies with import tariffs, export controls, investment screening and antitrust enforcement. Their useful corrective is that modern chip policy is a composite of instruments rather than a single subsidy lever³. Goldberg, Juhász, Lane, Lo Forte and Thurk, in an NBER working paper, put numbers to global subsidy activity and conclude that government support predominantly subsidy has indeed been vital to the industry's expansion. Two of their findings deserve more attention than they usually receive: that learning-by-doing effects are smaller than the standard justification for subsidy assumes, and that cross-border technology transfer, through foreign direct investment and licensing, is central to building capability. Their conclusion that China is "not an outlier" once its market size is taken into account⁴ is a quiet warning against reading subsidy totals as a measure of policy success.

The second strand examines subsidy competition and the market distortions it produces. The OECD's value-chain study estimated that public support to twenty-one large semiconductor firms exceeded USD 50 billion across 2014–2018, with below-market debt and equity financing described as "particularly large" and heavily concentrated in a single jurisdiction⁵. Its 2025 policy brief finds that subsidies measured against producer revenue have climbed appreciably since 2020 in most regions, sharpening level-playing-field anxieties⁶. The combined message is straightforward and, for India, sobering:

³ Bown, C. P., & Wang, D. (2024). Semiconductors and modern industrial policy. *Journal of Economic Perspectives*, 38(4), 81–110. <https://doi.org/10.1257/jep.38.4.81>

⁴ Goldberg, P. K., Juhász, R., Lane, N. J., Lo Forte, G., & Thurk, J. (2024). Industrial policy in the global semiconductor sector (NBER Working Paper No. 32651). National Bureau of Economic Research. <https://doi.org/10.3386/w32651>

⁵ Organisation for Economic Co-operation and Development. (2019). Measuring distortions in international markets: The semiconductor value chain (OECD Trade Policy Papers). OECD Publishing. <https://doi.org/10.1787/8fe4491d-en>

⁶ Organisation for Economic Co-operation and Development. (2025). Recent trends in semiconductor subsidies (OECD Policy Briefs). OECD Publishing. <https://doi.org/10.1787/5e91af33-en>

subsidy is now pervasive, and once every serious contender subsidises, the instrument stops generating comparative advantage and the contest migrates toward execution.

The third strand turns to execution, governance and ecosystem design, and it is here that the present argument finds its closest scholarly anchor. A systematic review of 104 studies by Hu and colleagues proposes a “dual fit” framework fit between strategy and execution, and between execution and context and isolates two recurrent failure modes. “Governance failure” flows from misaligned incentives among the actors charged with delivery; “contextual failure” flows from neglect of local absorptive capacity. The framing matters because it relocates the determinants of success away from the magnitude of the incentive and toward the quality of institutional delivery.⁷

The supply-chain economics literature, represented by the Semiconductor Industry Association and Boston Consulting Group, supplies the structural backdrop: more than fifty points in the value chain where one region commands over sixty-five per cent of global share, and an estimate that genuinely self-sufficient regional supply chains would demand at least USD 1 trillion in additional investment and lift chip prices by thirty-five to sixty-five per cent⁸. These literatures converge on a proposition that India’s policy design has not yet fully absorbed capital is necessary, but governance decides.

The fourth observation runs through all three. If, as Goldberg and colleagues argue, headline subsidy totals are poor predictors of outcomes because learning spillovers leak across borders and because even the largest spender has not, market size aside, secured outsized returns—and if, as the OECD documents, subsidies are rising almost everywhere, then jurisdictions are caught in a collective-action trap, escalating incentives while their relative positions barely move. The analytically interesting margin, on this

⁷ Hu, H., et al. (2026). Managing technological sovereignty: A systematic review of semiconductor industry policy and regional ecosystem governance. *Frontiers in Research Metrics and Analytics*, 11, Article 1762083. <https://doi.org/10.3389/frma.2026.1762083>

⁸ Semiconductor Industry Association, & Boston Consulting Group. (2021). Strengthening the global semiconductor supply chain in an uncertain era. <https://www.semiconductors.org/strengthening-the-global-semiconductor-supply-chain-in-an-uncertain-era/>

reading, is not how much a state spends but how efficiently it converts spending into operating capacity, a conversion governed by precisely the execution variables that occupy the centre of this paper. There is, as yet, no settled theory of regulatory execution specific to semiconductors; I intend this article as a contribution toward that gap, with India a case in which the execution question is unusually consequential and unusually unresolved.

IV. GLOBAL SEMICONDUCTOR GEOPOLITICS

The strategic weight of semiconductors rests on a degree of geographic concentration that has no real analogue among critical industrial inputs. Something like seventy-five per cent of global manufacturing capacity sits in China and East Asia, and the whole of sub-ten-nanometre capacity the leading edge on which artificial intelligence, advanced computing and modern weapons systems depend is split between Taiwan, at ninety-two per cent, and South Korea, at eight.⁹ Concentration of that order converts an everyday commercial dependency into a systemic fragility: a disruption at one node would ripple through the global economy with little prospect of swift substitution.

Governments answered with a wave of national programmes that the comparative literature now reads as a single phenomenon. The United States passed the CHIPS and Science Act of 2022, signed into law on 9 August 2022¹⁰ and financed through a CHIPS for America Fund whose first five years of appropriations total USD 50 billion; the Department of Commerce directs roughly USD 39 billion of that sum to manufacturing incentives and USD 11 billion to research and development, while a separate official accounting folding in defence, State Department and workforce programmes puts the

⁹ Semiconductor Industry Association. (2023). 2023 state of the U.S. semiconductor industry. https://www.semiconductors.org/wp-content/uploads/2023/08/SIA_State-of-Industry-Report_2023_Final_080323.pdf

¹⁰ CHIPS and Science Act of 2022, Pub. L. No. 117-167, 136 Stat. 1366 (2022). <https://www.govinfo.gov/content/pkg/PLAW-117publ167/html/PLAW-117publ167.htm>

broader federal commitment at USD 52.7 billion over five years¹¹, supplemented by a twenty-five-per-cent advanced-manufacturing investment tax credit under section 48D. The European Union responded with Regulation (EU) 2023/1781, the European Chips Act, in force since September 2023¹² and built around a target of twenty per cent of global market share by 2030; analysts estimate the public funding mobilised at about €43 billion, of which only roughly €3.3 billion comes from the Union budget itself.¹³ The East Asian incumbents answered in kind, and China has sustained a long-running drive for self-sufficiency funded through its National Integrated Circuit Industry Investment Fund, capitalised across three phases at 138.7 billion, 204 billion and 344 billion yuan.¹⁴

Two consequences follow for India, and they pull in the same direction. Because these programmes were launched almost simultaneously, incentives are now matched and counter-matched across the board; the OECD's evidence that support relative to revenue has risen in most regions confirms that India cannot expect subsidy by itself to buy durable advantage. And the very geopolitics that motivates these programmes also fences them in, because export-control regimes and technology-transfer restrictions increasingly dictate which equipment, processes and design tools a newcomer may lawfully obtain. India's opening, then, is shaped far less by its appetite to spend than by its ability to present itself as a reliable, well-governed and legally predictable node inside a value chain that is fragmenting and interdependent at the same time.

¹¹ U.S. National Institute of Standards and Technology. (2024). CHIPS for America fact sheet: Federal programs supporting the U.S. semiconductor supply chain and workforce. U.S. Department of Commerce. <https://www.nist.gov/document/chips-america-fact-sheet-federal-incentives>

¹² Regulation (EU) 2023/1781 of the European Parliament and of the Council of 13 September 2023 establishing a framework of measures for strengthening Europe's semiconductor ecosystem (Chips Act). (2023). Official Journal of the European Union, L 229, 1-53. <https://eur-lex.europa.eu/eli/reg/2023/1781/oj/eng>

¹³ European Union. (2024). Strengthening the EU's semiconductor ecosystem – Chips Act [Summary of legislation]. EUR-Lex, Publications Office of the European Union. <https://eur-lex.europa.eu/EN/legal-content/summary/strengthening-the-eu-s-semiconductor-ecosystem-chips-act.html>

¹⁴ State Council of the People's Republic of China. (2024, May 29). Six banks to invest in big way in IC fund. https://english.www.gov.cn/news/202405/29/content_WS66569746c6d0868f4e8e7987.html

V. INDIA'S SEMICONDUCTOR MISSION

The scaffolding of India's intervention is laid out in the Semicon India programme and administered by the India Semiconductor Mission, a unit housed within the Ministry of Electronics and Information Technology. The ₹76,000 crore outlay underwrites four instruments: a modified scheme for semiconductor fabs offering fifty per cent of project cost on a pari-passu basis; a matching scheme for display fabs; a scheme for compound semiconductors, silicon photonics, sensors and assembly-and-test facilities covering fifty per cent of capital expenditure; and a Design Linked Incentive that funds up to fifty per cent of eligible product-design spending alongside a deployment-linked incentive on net sales. The same source records an Indian semiconductor market of approximately USD 38 billion in 2023, projected to reach USD 109 billion by 2030 the demand-side rationale for building domestic capacity.¹⁵

The pipeline lends the programme credibility. Micron's Sanand assembly facility, at ₹22,516 crore, travelled from memorandum to commercial production¹⁶ between June 2023 and February 2026. The Cabinet's February 2024 decision cleared three units at once: the Tata Electronics–Powerchip fabrication plant at Dholera (₹91,000 crore, 50,000 wafer starts per month, 28-nanometre process); the Tata Semiconductor Assembly and Test facility at Morigaon, Assam (₹27,000 crore, capacity of 48 million units per day¹⁷); and the CG Power–Renesas–Stars Microelectronics assembly unit at Sanand¹⁸ (₹7,600 crore).

¹⁵ India Semiconductor Mission. (n.d.). About SemiconIndia programme. Ministry of Electronics and Information Technology, Government of India. Retrieved June 2026, from <https://ism.gov.in/about-semiconindia>

¹⁶ Ministry of Electronics and Information Technology. (2023, December 6). Micron's semiconductor project at Sanand in Gujarat on fast track [Press release]. Press Information Bureau, Government of India. <https://www.pib.gov.in/PressReleaseIframePage.aspx?PRID=1983128>

¹⁷ Ministry of Electronics and Information Technology. (2024b, August 3). Construction of Tata's semiconductor unit in Assam commences [Press release]. Press Information Bureau, Government of India. <https://www.pib.gov.in/PressReleaseIframePage.aspx?PRID=2041162>

¹⁸ Union Cabinet. (2024, February 29). Giant leap for India Semiconductor Mission: Cabinet approves three more semiconductor units [Press release]. Press Information Bureau, Government of India. <https://www.pib.gov.in/PressReleasePage.aspx?PRID=2010132>

Kaynes Semicon's Sanand unit (₹3,300 crore) was approved in September 2024¹⁹, and by May 2026 the cumulative count had reached twelve projects and roughly ₹1.64 lakh crore of investment, with the government announcing a successor phase under the banner of "India Semiconductor Mission 2.0."²⁰

Tellingly, the programme reaches past manufacturing into the upstream activities on which a self-sustaining ecosystem depends. The Design Linked Incentive backs product design with up to fifty per cent of eligible expenditure and a deployment-linked incentive on net sales, and design-infrastructure support has been extended to several hundred academic institutions and a swelling cohort of start-ups.²¹ The government has also approved the modernisation of the Semi-Conductor Laboratory at Mohali as a brownfield facility²² and has signalled continuity through the announced successor phase. This breadth is not incidental. It reflects a recognition that fabrication capacity on its own—without a domestic design base, a talent pipeline and a supplier network—would leave the country dependent and exposed. Yet the same breadth enlarges the execution burden, because every additional element multiplies the regulatory and coordination touchpoints the state must manage without slipping.

Most relevant to the argument here, the programme has lately begun to reach for regulatory levers rather than fiscal ones. A significant step was the notification of the

¹⁹ Ministry of Electronics and Information Technology. (2024c, September 2). Cabinet approves one more semiconductor unit under India Semiconductor Mission (ISM) [Press release]. Press Information Bureau, Government of India. <https://www.pib.gov.in/PressReleaseIframePage.aspx?PRID=2050859>

²⁰ Ministry of Electronics and Information Technology. (2026, May 5). Cabinet approves two more semiconductor manufacturing units [Press release]. Press Information Bureau, Government of India. <https://www.pib.gov.in/PressReleasePage.aspx?PRID=2258119>

²¹ Ministry of Electronics and Information Technology. (2024a, July 31). Government of India taking steps to encourage domestic manufacturing of semiconductors [Press release]. Press Information Bureau, Government of India. <https://www.pib.gov.in/PressReleaseIframePage.aspx?PRID=2039638>

²² Standing Committee on Communications and Information Technology. (2025). Demands for grants (2025–26), Ministry of Electronics and Information Technology (Ninth Report, Eighteenth Lok Sabha). Lok Sabha Secretariat.

https://eparlib.sansad.in/bitstream/123456789/2989861/1/18_Communications_and_Information_Technology_9.pdf

Special Economic Zones (Amendment) Rules, 2025 on 3 June 2025,²³ which reduced the minimum land requirement for semiconductor and electronics-component Special Economic Zones from fifty hectares to ten hectares, relaxed certain land-related conditions, and permitted greater flexibility for domestic tariff area sales in accordance with the amended regulatory framework. These reforms created a more enabling legal environment for semiconductor manufacturing. Subsequently, in April 2026, the Government notified India's first chip-fabrication Special Economic Zone at Dholera for Tata Semiconductor Manufacturing Pvt. Ltd., representing the practical implementation of the earlier regulatory reforms rather than their occasion. This sequence exemplifies the type of regulatory recalibration advocated in this article; however, the fact that these reforms emerged during implementation rather than being embedded at the programme's inception illustrates the reactive regulatory posture that this paper argues should be replaced by a more anticipatory governance framework.

VI. WHY SUBSIDIES ALONE ARE NOT ENOUGH

The objection to a subsidy-centred policy is not that subsidy is misguided. It is that subsidy is necessary, insufficient and self-cancelling all at once. It is necessary because fabrication carries extreme capital intensity and a steep first-mover penalty; a latecomer staring at entrenched clusters in Taiwan, Korea and the United States simply cannot draw leading-edge capital without taking the early risk off the table. It is insufficient because the constraints that actually bind a fab—an unbroken flow of ultrapure water, continuous high-quality power, rapid environmental clearance, frictionless import of equipment and materials—are untouched by a capital grant. And it is self-cancelling because the instrument has gone universal: the OECD finds subsidies climbing against revenue in most regions, and Bown and Wang show that every major jurisdiction now fields a comparable composite of measures. Once all the serious competitors subsidise, the

²³ Department of Commerce. (2025, June 3). *Special Economic Zones (Amendment) Rules, 2025*, G.S.R. 364(E), Ministry of Commerce and Industry, Government of India; see also Ministry of Commerce and Industry. (2025, June 9).

marginal investor chooses among them on execution reliability, not on the generosity of the cheque.

The empirical work points the same way. Goldberg and colleagues find that subsidy has been the dominant global form of support, yet that learning-by-doing the very mechanism through which subsidy is supposed to manufacture durable advantage is weaker than assumed and bleeds substantially across borders, which undercuts the appropriability case for unconditional grants. The Hu review is blunter, assigning ecosystem failure to governance and context rather than to thin funding. For India the corollary is concrete: a rupee spent compressing an environmental-clearance timeline, guaranteeing a water allocation, or building a predictable customs lane may purchase more competitive advantage than an additional rupee of capital subsidy the first buys something rivals cannot instantly copy, the second something they can always match.

A question of fiscal sustainability and opportunity cost also forces itself into view. A strategy that aims to win chiefly by out-bidding competitors signs the state up to a contest with no natural finish line, against rivals some with far deeper reserves who can answer every raise. Execution advantages behave differently: a jurisdiction that earns a reputation for delivering a ready-to-build, fully-cleared, resource-assured site on a predictable schedule acquires a reputational asset that compounds across investment cycles, much as Taiwan's institutional ecosystem has compounded over decades. The claim, then, is not merely that execution matters alongside subsidy; it is that execution is the more defensible long-run basis of competitive position, and that subsidy is best understood as a transitional device, to be progressively complemented and, in time, partly displaced by demonstrated regulatory reliability.

VII. REGULATORY EXECUTION CHALLENGES

Few industries test regulatory capacity as severely as semiconductor fabrication, because its inputs are at once enormous in scale, exacting in quality and intolerant of interruption. The subsections that follow take the principal execution variables in turn. Some rest on

statutes whose text and operation are settled features of Indian law; others draw their factual premises from the comparative and industry literature.

A. Land

Acquiring contiguous, encumbrance-free land at scale in India is governed by the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013, which requires social-impact assessment, consent thresholds for certain categories of acquisition, and rehabilitation-and-resettlement obligations²⁴. These safeguards answer genuine constitutional and distributive concerns. The difficulty is one of tempo: the multi-stage process the Act prescribes does not sit easily beside the timelines of a global investor weighing competing sites. The government's recourse to state-held land and Special Economic Zone structures—the Dholera SEZ being the obvious example—and the 2026 cut in the minimum SEZ threshold from fifty to ten hectares are pragmatic workarounds. The deeper lesson is one of sequencing. Land assembly should be completed and de-risked by the state before a project is put before investors, not left as a residual hazard quietly transferred to the licensee.

B. Water

A fab consumes ultrapure water in volumes that make water security a first-order siting constraint rather than an afterthought. A peer-reviewed survey of twenty-eight manufacturers reported an average water-use intensity of 8.22 litres per square centimetre of processed wafer and aggregate withdrawal of roughly 789 million cubic metres in a single year, with surface water and municipal supply together meeting more than eighty per cent of demand²⁵. In an Indian setting, where several candidate states already face seasonal water stress, that profile means a plant's viability turns on a legally secure, long-term raw-water allocation and on serious investment in recycling and zero-

²⁴ Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, No. 30 of 2013, India Code (2013). <https://www.indiacode.nic.in/handle/123456789/2121>

²⁵ Wu, Y., et al. (2023). Environmental data and facts in the semiconductor manufacturing industry: An unexpected high water and energy consumption situation. *Water Cycle*, 4(1), 47-54. <https://doi.org/10.1016/j.watcyc.2023.01.004>

liquid-discharge infrastructure. Water assurance, importantly, is not a subsidy problem. It is a problem of inter-sectoral allocation, water-rights administration and municipal capacity domains that fall squarely within regulatory execution and that no grant can resolve.

C. Environmental approvals

Environmental clearance in India runs through the Environment Impact Assessment Notification, 2006, issued under the Environment (Protection) Act, 1986, which classifies projects and prescribes screening, scoping, public consultation and appraisal.²⁶ A fab's water draw, effluent profile and chemical handling place it firmly inside the regime. The policy task is to reconcile rigorous scrutiny both lawful and desirable with the predictability investors require, and the answer is not to dilute standards. It is to supply procedural certainty: statutory timelines for each stage, pre-cleared industrial parks where strategic environmental assessment has been completed in advance, and a digitised, trackable appraisal process. Predictability and protection, properly designed, reinforce rather than oppose each other.

D. Power reliability

Fabrication processes will not tolerate voltage fluctuation or outage; a momentary interruption can ruin wafers of substantial value. The industry literature records that electricity dominates fabrication energy use, with an average intensity of 1.15 kilowatt-hours per square centimetre of wafer²⁷. Indian policy must therefore guarantee not merely the quantity of power but its quality and continuity – which implicates dedicated feeders, open-access regulation, tariff certainty and, given corporate decarbonisation commitments and the carbon intensity of the process, access to firm renewable supply.

²⁶ Ministry of Environment, Forest and Climate Change. (2006). Environment Impact Assessment Notification, 2006 (S.O. 1533(E)). Government of India.

<https://environmentclearance.nic.in/writereaddata/EIA%20Notifications.pdf>

²⁷ Wu, Y., et al. (2023). Environmental data and facts in the semiconductor manufacturing industry: An unexpected high water and energy consumption situation. *Water Cycle*, 4(1), 47-54.

<https://doi.org/10.1016/j.watcyc.2023.01.004>

These are questions of electricity regulation and state distribution-utility performance again, execution rather than the incentive ledger.

E. Customs and trade

A fab imports highly specialised equipment, precursor chemicals and gases on a rolling basis, and any delay or unpredictability at the border converts directly into production risk. The competitiveness of an Indian facility consequently depends on trade-administration performance: the tariff treatment of capital goods and inputs, the speed and predictability of clearance, bonded warehousing, and the operation of the SEZ regime under which the Dholera plant is structured. Trade facilitation is a textbook case in which administrative reliability, not fiscal generosity, decides whether a plant can run at world-class cycle times.

F. Labour regulation

India has folded twenty-nine central labour statutes into four Labour Codes covering wages, industrial relations, social security, and occupational safety, health and working conditions which came into force in November 2025.²⁸ For a continuous-process, high-precision industry the live questions are the flexibility of shift and working-hour arrangements, occupational-safety compliance in hazardous-chemical environments, and the supply of skilled technicians. Codification creates an opening to deliver worker protection and operational predictability together, but the gain is contingent on the timely notification of consistent central and state rules an execution task, not a legislative one. The codes on the statute book are necessary; harmonised rules actually in force are what an investor can plan around.

²⁸ Ministry of Labour and Employment. (2025, November 21). Government makes the four Labour Codes effective to simplify and streamline labour laws [Press release]. Press Information Bureau, Government of India. <https://www.pib.gov.in/PressReleasePage.aspx?PRID=2192463>

G. Technology transfer

India's fabrication entrants depend on process technology licensed from foreign partners Powerchip in the Tata-Dholera fab, Renesas in the CG Power assembly venture. The economics literature identifies cross-border transfer through foreign direct investment, collaboration and licensing as central to capability formation in this sector. The regulatory implication is direct: India must offer a legal environment in which foreign licensors are confident that their technology, trade secrets and contractual entitlements will be protected and enforced. Technology transfer, in other words, cannot be prised apart from the credibility of India's contract-enforcement, dispute-resolution and intellectual-property institutions.

H. Export controls

The acquisition of advanced manufacturing equipment and electronic-design-automation tools is increasingly governed by the export-control regimes of supplier jurisdictions, and the comparative literature treats export controls as a core instrument of contemporary semiconductor policy. India's ability to import leading-edge capability is therefore partly exogenous, contingent on its standing within allied technology-security arrangements. The matching domestic task is to maintain a robust strategic-trade-control system and a track record of reliable end-use assurance, so that India is read as a trusted destination rather than a diversion risk—an objective in which legal compliance architecture and sustained government engagement, not capital, are decisive.

I. Intellectual property

Intellectual-property protection underwrites both inbound technology transfer and the domestic design ecosystem the Design Linked Incentive is meant to cultivate. Investors weigh not only the formal adequacy of patent, design and trade-secret law but the speed and predictability with which it is enforced. For a jurisdiction hoping to host licensed leading-edge processes and to grow indigenous design houses, the practical determinants are the pendency of patent examination, the sophistication of courts handling technical disputes, and the security of confidential know-how transferred under

licence. Here too the binding constraint is institutional performance rather than statutory text. The Design Linked Incentive in particular lives or dies on whether Indian and foreign design teams trust that the layouts, intellectual property and trade secrets they generate or import will be defensible; a slow or porous enforcement environment would quietly hollow out the very design base the programme is trying to build, however generous the incentive looks on paper.

Set side by side, these nine variables describe a system in which failure on any single input can neutralise success on all the others. A plant with a generous grant, secure land and abundant power remains unviable if its environmental clearance is unpredictable, if customs delays starve it of process chemicals, or if a prospective licensor judges the technology-transfer and intellectual-property environment unsafe. This conjunctive quality the binding constraint is the weakest link, not the average marks regulatory execution off from ordinary industrial facilitation, and is why the policy emphasis must shift from maximising the incentive to guaranteeing every input at once.

J. Regulatory Execution Index: A Proposed Framework for Evaluating Semiconductor Readiness

If the weakest link governs the system, then policymakers and investors need a way to see the links individually rather than to argue over an aggregate incentive figure. I propose, as an original contribution of this paper, a Regulatory Execution Index (REI): a structured, diagnostic instrument that scores a candidate jurisdiction or, within India, a candidate state or industrial park across the nine execution variables analysed above. It is intended as a disciplined accounting of where delivery capacity is thin, converting the diffuse language of “ease of doing business” into the specific dependencies that fabrication imposes.

The Index assesses nine dimensions, each scored on a 0–10 scale against defined, evidence-based criteria:

1. land readiness, measured by the proportion of contiguous, encumbrance-free, master-planned land available before solicitation and the completeness of rehabilitation-and-resettlement compliance under the 2013 Act;
2. water security, measured by the existence of a legally enforceable long-term raw-water allocation and the installed share of recycling and zero-liquid-discharge capacity relative to the 8.22-litre-per-square-centimetre demand benchmark;
3. power reliability, measured by guaranteed uptime, voltage stability, dedicated-feeder provision and access to firm renewable supply against the 1.15-kilowatt-hour intensity benchmark;
4. environmental approvals, measured by the presence of statutory stage-wise timelines and pre-completed strategic environmental assessment for the relevant park;
5. customs efficiency, measured by clearance time and predictability for capital goods and process chemicals and by the maturity of bonded-warehousing and SEZ administration;
6. labour flexibility, measured by the notification status and consistency of rules under the four Labour Codes and by shift and occupational-safety arrangements suited to continuous processing;
7. technology-transfer readiness, measured by the enforceability of licensing arrangements and the security afforded to foreign process know-how;
8. export-control compliance, measured by the robustness of the strategic-trade-control system and the jurisdiction's standing within allied technology-security arrangements; and
9. intellectual-property enforcement, measured by patent-examination pendency, judicial competence in technical disputes and the strength of trade-secret protection.

Two design choices distinguish the REI from a conventional composite ranking. First, the Index is deliberately not a simple arithmetic mean. Because the variables are conjunctive

because the system fails at its weakest point the REI pairs the average score with a binding-constraint score equal to the lowest dimension, and treats any dimension below a defined floor (say, 4 of 10) as a disqualifying red flag regardless of how strong the other eight appear. A jurisdiction that scores nine on eight dimensions and three on water has not earned a high readiness rating; it has identified the single problem that will determine its fate. Second, the dimensions can be weighted to the technology node and project type: leading-edge logic fabrication should weight water, power and export-control compliance most heavily, whereas assembly-and-test operations should weight customs efficiency and labour flexibility making the weighting a transparent policy judgment rather than a hidden one.

| REI Dimension | Primary Indian instrument / benchmark | What a high score signals |
|--------------------------------|---|---|
| Land readiness | RFCTLARR Act, 2013; SEZ Rules (10-ha threshold) | Pre-aggregated, cleared, ready-to-build site |
| Water security | Raw-water allocation; ZLD; 8.22 L/cm ² benchmark | Enforceable long-term supply + recycling capacity |
| Power reliability | Open-access rules; 1.15 kWh/cm ² benchmark | Guaranteed uptime, voltage stability, firm renewables |
| Environmental approvals | EIA Notification, 2006 (under EPA, 1986) | Statutory timelines + pre-completed SEA |

| | | |
|--|--|--|
| Customs efficiency | Customs/SEZ regime; bonded warehousing | Fast, predictable clearance of tools and chemicals |
| Labour flexibility | Four Labour Codes (in force Nov 2025) | Notified, consistent rules for continuous processing |
| Technology-transfer readiness | Contract enforcement; licensing security | Confident foreign licensors (Powerchip, Renesas) |
| Export-control compliance | Strategic-trade controls; end-use assurance | Trusted-destination status under allied regimes |
| IP enforcement | Patent, design and trade- secret law + courts | Low pendency; defensible designs and know-how |

Applied to India, the REI does more than rank; it predicts where attention should go. The country's recent moves—the Dholera SEZ, the land-threshold amendment, the operationalised Labour Codes—would lift its land and labour dimensions, yet the framework would almost certainly flag water security, environmental-approval predictability and intellectual-property enforcement as the binding constraints on leading-edge logic ambitions, precisely because these depend on slow-moving institutional performance rather than on instruments that can be notified overnight. The REI thus operationalises the paper's central claim: it forces the analysis off the comfortable terrain of headline outlay and onto the harder terrain of delivery, and gives the Union and the states a shared, auditable scorecard for planning and measuring execution-focused reform.

VIII. COMPARATIVE INTERNATIONAL ANALYSIS

The six leading jurisdictions offer instructive contrasts, and one lesson recurs: subsidy operated alongside, and subordinate to, sustained institutional execution.

Taiwan built its dominance on a decades-long institutional project rather than on cash. The 1976 transfer of manufacturing technology from RCA to the state-backed Industrial Technology Research Institute, the subsequent spinning-out of TSMC and the pioneering of the pure-play foundry model, and the patient cultivation of the Hsinchu Science Park ecosystem which by a recent measure hosts firms accounting for USD 363 billion in semiconductor revenue²⁹ together describe an accretion, not a purchase. Durable advantage, the Taiwanese case shows, is assembled over time out of research institutions, talent and clustered suppliers' assets subsidy can nourish but cannot conjure.

South Korea couples' fiscal incentives with spatial and institutional concentration. Its K-Chips Act, enacted in 2023, lifted the investment tax credit to twenty-five per cent for smaller firms and fifteen per cent for larger ones³⁰; but the more striking element is the ₩300 trillion Yongin mega-cluster, intended to become the world's largest system-chip complex by 2042³¹, reinforced in 2024 by a substantial additional incentive package and a Gyeonggi cluster expected to draw extensive private investment. Korea's contribution to the argument is execution through coordinated cluster planning, infrastructure provision and a deliberate talent strategy.

²⁹ Reinsch, W. A., & Whitney, J. (2025, January 10). Silicon island: Assessing Taiwan's importance to U.S. economic growth and security. Center for Strategic and International Studies. <https://www.csis.org/analysis/silicon-island-assessing-taiwans-importance-us-economic-growth-and-security>

³⁰ Goodwin Procter LLP. (2023, June 30). The South Korean K-Chips Act and its impact on international companies and investors. <https://www.goodwinlaw.com/en/insights/publications/2023/06/alerts-privateequity-the-south-korean-k-chips-act>

³¹ Shin, J. (2023, March 15). Korea sets out ₩300tr plan to build world's largest system chip cluster. The Korea Herald. <https://www.koreaherald.com/article/3082232>

Japan has been trying to claw its way back after watching its share of world production fall from over fifty per cent in the late 1980s to roughly nine per cent by 2022³², with its most advanced domestic fabs running about a decade behind the leading edge. Its approach marries a rising public commitment the semiconductor budget grew from approximately ¥774 billion in fiscal 2021 to about ¥1.85 trillion in fiscal 2023 with large project-specific subsidies of up to ¥476 billion and subsequently ¥732 billion for the TSMC-anchored JASM venture in Kumamoto, and with the Rapidus initiative targeting two-nanometre production in partnership with IBM in Hokkaido.³³ The experience is doubly instructive for India. It demonstrates that even generous subsidy cannot quickly rebuild a capability base once the surrounding ecosystem suppliers, materials firms, leading-edge process knowledge has eroded; and it shows the value of anchoring revitalisation around an established foreign foundry partner while investing in indigenous frontier capability, the dual-track logic visible in India's own programme.

The United States deployed the CHIPS and Science Act's incentives and a twenty-five-per-cent tax credit, which industry associates with more than USD 200 billion in announced private investment³⁴; the catalytic effect of the announcement was, by any standard, substantial. The gap between commitment and realised output is exactly where execution becomes visible. Early independent analysis attributes a comparatively modest number of new semiconductor-production jobs – on the order of fifteen thousand³⁵ – to the law in its initial phase, and American commentary has fastened on permitting, construction timelines and workforce availability as the practical brakes on deployment. That the world's wealthiest economy, fielding the most generous package, has run into

³² Shivakumar, S., Wessner, C., & Howell, T. (2023, August 25). Japan seeks to revitalize its semiconductor industry. Center for Strategic and International Studies. <https://www.csis.org/analysis/japan-seeks-revitalize-its-semiconductor-industry>

³³ Ministry of Economy, Trade and Industry. (2024, July). Outline of semiconductor revitalization strategy in Japan. Government of Japan. https://www.meti.go.jp/english/policy/0704_001.pdf

³⁴ Chorzempa, M. (2024, June 10). The US and Korean CHIPS Acts are spurring investment but at a high cost. Peterson Institute for International Economics. <https://www.piie.com/blogs/realtime-economics/2024/us-and-korean-chips-acts-are-spurring-investment-high-cost>

³⁵ Erten, B., Stiglitz, J. E., & Verhoogen, E. (2025, December). Has the CHIPS Act created jobs? The Brookings Institution. <https://www.brookings.edu/articles/has-the-chips-act-created-jobs/>

execution friction as its principal constraint is about the strongest corroboration this paper's thesis could ask for and for a later entrant such as India, with thinner administrative margins, those frictions are not a secondary worry but the centre of the problem.

The European Union frames its Chips Act around a market-share objective – twenty per cent by 2030 and a mobilisation of public funding that analysts place at roughly €43 billion, of which only about €3.3 billion comes from the Union budget, the remainder from member states and an €11 billion joint undertaking.³⁶ The European case foregrounds the coordination challenge of a multi-level polity, an instructive and slightly uncomfortable parallel to India's own centre-state structure.

China has chased self-sufficiency through its National Integrated Circuit Industry Investment Fund – the “Big Fund” – established in three phases with registered capital of 138.7 billion yuan (2014), 204 billion yuan (2019) and 344 billion yuan (2024), within the broader Made in China 2025 framework that targeted seventy-per-cent localisation. CSIS analysis records that domestically produced chips met roughly thirty per cent of domestic consumption in 2025, well short of the target, despite an estimated USD 150 billion in cumulative public funding; it further notes that China's integrated-circuit output fell by 9.8 per cent in 2022 after the imposition of export controls, even as the domestically produced share of semiconductor-manufacturing equipment rose from twenty-five to thirty-five per cent between 2024 and 2025.³⁷ China is at once the clearest cautionary tale and evidence for a subtler proposition. Scale of funding is not destiny: the binding constraints – access to leading-edge equipment, process know-how, ecosystem maturity – are not soluble by capital alone, and the economic literature finds that,

³⁶ Shivakumar, S., Wessner, C., & Howell, T. (2024, August 20). A world of chips acts: The future of U.S.-EU semiconductor collaboration. Center for Strategic and International Studies.

<https://www.csis.org/analysis/world-chips-acts-future-us-eu-semiconductor-collaboration>

³⁷ Shivakumar, S., Wessner, C., & Howell, T. (2026, March 24). China's localization drive in semiconductors gains impetus from allied chip export controls. Center for Strategic and International Studies. <https://www.csis.org/analysis/chinas-localization-drive-semiconductors-gains-impetus-allied-chip-export-controls>

adjusted for market size, China is not an outlier in the returns its subsidy has bought. For India, emulating China's spending without surpassing it on execution and on openness to trusted technology partners would risk reproducing its shortfall rather than its scale.

IX. GOVERNANCE AND REGULATORY REFORM FRAMEWORK

The comparative record and structural economics suggest a reform framework organised around the execution variables, governed by four design principles.

The first is pre-clearance and de-risking. The state should assemble land, complete strategic environmental assessment, and secure water and power allocations for designated semiconductor parks before it solicits investors at all, converting a portfolio of contingent risks into a guaranteed, ready-to-build offer. The Dholera SEZ and the 2026 land-threshold amendment gesture in this direction, but they were adopted reactively; the principle deserves to be institutionalised at the design stage and embedded in the REI as a standing expectation.

The second is statutory timelines and a genuine single window. Environmental, building, water and trade approvals should carry binding statutory timelines and be administered through a single empowered authority with the legal power to bind line departments— not a portal that merely forwards applications and tracks their fate. Predictability, the systematic-review evidence suggests, is itself a competitive asset— and one of the few a determined administration can manufacture quickly.

The third is resource assurance as a legal entitlement. Long-term water and firm-power supply should be written into enforceable agreements with defined remedies, because for fabrication these inputs are not conveniences but existential dependencies, and an unenforceable promise is, to an investor pricing risk, barely a promise at all.

The fourth is institutional credibility for technology and intellectual property. Specialised dispute resolution, expedited patent examination and robust trade-secret protection should be prioritised, both to reassure foreign licensors and to nurture the domestic design base that the incentive programme is meant to seed.

Beneath all four lies the centre–state coordination problem. Because land, water, power, labour-rule notification and local clearances are substantially state subjects, while the incentive and strategic framework are central, India needs a coordinating architecture analogous in ambition to the cluster-governance models of Korea able to align central incentives with state delivery through binding, time-bound commitments rather than exhortation. The European experience is salutary: even a polity with mature institutions has found multi-level coordination demanding, with only a small fraction of headline funding originating federally. India’s federal structure poses an analogous and arguably sharper challenge, because the inputs most critical to fabrication sit predominantly with the states while the fiscal and diplomatic instruments sit with the Union—a division the coordinating architecture must bridge rather than lament.

The Hu review supplies a useful diagnostic lens. Its distinction between governance failure—misaligned incentives among the actors responsible for delivery—and contextual failure—a mismatch between policy ambition and local absorptive capacity in talent, suppliers and institutions—maps cleanly onto the reform agenda. The single-window and centre–state coordination reforms address governance failure; the talent, design-ecosystem and supplier-development elements address contextual failure by building the absorptive capacity without which even a well-governed incentive will underperform. Attend to only one of these failure modes, and the other will undo it.

X. THE ROLE OF CORPORATE AFFAIRS AND GOVERNMENT RELATIONS

Running quietly through this analysis is a claim worth making explicit: ecosystem development is not policy enacted upon passive firms, but something co-produced by the corporate-affairs, public-policy and government-relations functions inside the firms themselves. Where the binding constraints are regulatory, these functions do work that is strategic rather than merely administrative. They translate a firm’s operational requirements—water assurance, power quality, clearance timelines, customs predictability—into specific, evidence-based regulatory submissions; they manage the

firm's compliance posture under export-control and strategic-trade regimes so that it is treated as a trusted counterparty; and they sustain the structured engagement with authorities and regulators through which generalised policy intent becomes project-specific delivery.

The same function is the custodian of the legal certainty on which inbound technology transfer depends: the negotiation and protection of licensing arrangements, the safeguarding of trade secrets, and the management of cross-border contractual and dispute-resolution risk. Each of India's flagship fabrication and assembly projects rests on a foreign technology partnership Powerchip, Renesas and others and the durability of those partnerships depends on the contractual and compliance architecture that corporate-affairs and legal teams build and maintain, architecture that also signals to home and host governments that the firm is a trustworthy steward of controlled technology.

Where the literature identifies governance failure as a principal cause of ecosystem disappointment, a capable corporate-affairs practice operates as a private complement to public governance, surfacing gaps early rather than letting them harden into dispute. To treat these functions as material contributors to national semiconductor ambition rather than as overhead is itself part of the institutional maturation the sector requires, and it implies that developing regulatory, public-policy and government-relations talent is as much a part of ecosystem-building as the training of process engineers.

XI. SUGGESTIONS AND RECOMMENDATIONS

The analysis yields eight recommendations, ordered from the structural to the specific reasoned proposals consistent with the verified evidence, not forecasts.

1. Reframe the policy objective from incentive disbursement to execution guarantee. Because subsidy is now universal and non-differentiating, India should compete on the reliability of land, water, power, clearances and trade administration, and

should judge programme success by build-time and uptime metrics rather than by sanctioned outlay alone.

2. Establish statutory clearance timelines and an empowered single-window authority able to bind line departments, preserving the substantive rigour of the EIA Notification, 2006, while eliminating the procedural uncertainty that surrounds it.
3. Provide pre-assembled, pre-cleared semiconductor parks, with land aggregated under the RFCTLARR framework, strategic environmental assessment completed, and water and power secured before any investor is approached.
4. Guarantee water and firm power as enforceable long-term entitlements, with mandated recycling and zero-liquid-discharge standards, in recognition of fabrication's documented resource intensity.
5. Strengthen the institutions that secure technology transfer and intellectual property specialised technical adjudication, expedited examination and trade-secret enforcement – to reassure licensors and grow the domestic design base.
6. Maintain a credible strategic-trade-control and end-use-assurance system to preserve access to controlled equipment and tools within allied technology-security arrangements.
7. Institutionalise binding centre-state coordination through time-bound delivery commitments, drawing on the coordinated cluster-governance experience of East Asian peers.
8. Recognise corporate-affairs and government-relations capacity as part of national ecosystem infrastructure, and structure regular, evidence-based public-private engagement to find and close execution gaps. Adopting the Regulatory Execution Index as a shared scorecard would give each of these recommendations a common measurement frame.

XII. CONCLUSION

India's decision to subsidise semiconductor manufacturing was a reasonable, and probably necessary, response to first-mover disadvantage, and the resulting pipeline of approved projects is a genuine achievement. The international evidence is nonetheless unambiguous: subsidy has become a universal instrument, matched across every serious jurisdiction, and therefore incapable on its own of conferring durable comparative advantage. What will actually determine whether India's fabs reach and sustain world-class operation lies elsewhere – in the supply of land, water and power; in the speed and predictability of environmental and trade clearances; in the credibility of its technology-transfer and intellectual-property institutions; and in the discipline of its centre-state coordination. These are problems of regulatory execution and state capacity, and the comparative cases, from Taiwan's patient institutional accretion to China's expensive shortfall, confirm that capital cannot stand in for them. India's 2025 recalibration of the Special Economic Zones regulatory framework, followed by the notification of the Dholera semiconductor Special Economic Zone in 2026, demonstrates that the state is capable of deploying regulatory reforms alongside fiscal incentives to strengthen semiconductor manufacturing. The task now is to make execution-focused reform the centre of the strategy rather than its afterthought, and to measure progress against an instrument – such as the Regulatory Execution Index proposed here – that keeps the weakest link in view. Build the regulatory machinery to match the fiscal ambition, and the Semiconductor Mission can become a durable platform for responsible innovation, regulatory excellence and long-term economic growth.

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