GOVERNING GREEN START-UPS: A COMPARATIVE LEGAL STUDY OF INNOVATION-LED SUSTAINABLE DEVELOPMENT IN INDIA AND SCANDINAVIA

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ABSTRACT

Green start-ups are increasingly recognised as drivers of innovation-led sustainable development through renewable energy, circular economy practices, electric mobility, waste management, and climate technologies. India and Scandinavia, particularly Denmark, Norway, and Sweden, offer distinct legal, institutional, and economic approaches to promoting green entrepreneurship. While India is developing its green innovation ecosystem through environmental legislation, Startup India, renewable energy policies, and sustainability regulations, Scandinavian countries have established policy and regulatory frameworks that integrate environmental objectives with technological innovation, research, and sustainable business development. This study comparatively examines the legal and institutional frameworks governing green start-ups in India and Scandinavia, focusing on their effectiveness in promoting environmental innovation while ensuring ecological accountability. It analyses constitutional provisions, environmental statutes, climate policies, financial incentives, intellectual property protection, sustainability disclosure requirements, and regulatory mechanisms, and investigates challenges relating to green finance, regulatory compliance, technology transfer, environmental accountability, and scalability. Illustrative data from the Organisation for Economic Co-operation and Development (OECD) indicate that environment-related technologies accounted for 24% of Danish patents in 2018, while Denmark's carbon dioxide emissions in 2020 were approximately 50% below their 1990 levels. These indicators provide a comparative context for examining the relationship between green innovation, policy support, and environmental outcomes.

Keywords: green start-ups; sustainable development; comparative law; Startup India; Scandinavian environmental law; circular economy; green finance

I. Introduction

The Brundtland formulation of sustainable development, meeting present needs without compromising the ability of future generations to meet theirs, has long been treated as a legal principle in search of institutions. Law can prohibit pollution, but prohibition alone does not produce the technologies sustainable development requires, and these increasingly emerge from small, venture-backed green start-ups. How a legal system treats such firms, in terms of permission, price signals, finance, market access and accountability, therefore influences whether sustainable development is achieved by innovation or merely imposed through restriction. India and Scandinavia offer a revealing pairing. India has over 1,50,000 start-ups recognised by the Department for Promotion of Industry and Internal Trade (DPIIT), while facing acute pollution and a 2070 net-zero commitment; the Scandinavian countries have among the world's highest carbon prices, near-completely decarbonised electricity systems and consistently high innovation rankings.

One multi-region study credits green entrepreneurship models with job creation and average CO2 reductions of 60,000 tons per year,[1] and legal scholarship holds that governments can amplify this by simplifying registration and offering targeted incentives.[2]

Yet the governance of green start-ups is a collision of two regulatory traditions: promotional law, which subsidises, finances and incubates new firms, as in India's Startup India initiative; and environmental law, which binds all actors, including the newest and smallest, to ecological accountability, as in Scandinavia's integrated environmental codes and binding climate targets. The central puzzle of this paper is the relationship between the two. A green start-up is both beneficiary of promotional law and subject of environmental law; the question is whether these regimes reinforce each other, as the "Porter hypothesis" tradition suggests that well-designed regulation stimulates innovation, or operate in silos. Cross-country evidence bears on this puzzle: analysis of eleven entrepreneurship indicators and environmental regulation across

[1]Olha Prokopenko et al., Innovative Models of Green Entrepreneurship: Social Impact on Sustainable Development of Local Economies, 8 Econ. Ecology Socium 88 (2024).
[2]A. Kwilinski, O. Lyulyov and T. Pimonenko, Green Economic Development and Entrepreneurship Transformation, 12 Entrepreneurial Bus. & Econ. Rev. 157 (2024).

eighteen countries finds a critical regulatory threshold at which regulation's relationship to green technology innovation shifts.[3]

India's DPIIT-recognised start-ups grew from around 502 in 2016 to 157,706 by December 2024,[4] while Scandinavia pairs comprehensive environmental codes, such as Sweden's Environmental Code of 1998, with ambitious climate frameworks and dense green finance markets. Illustrative OECD data indicate that environment-related technologies accounted for 24% of Danish patents in 2018, while Denmark's carbon dioxide emissions in 2020 were approximately 50% below their 1990 levels.[5] The comparative question follows: does the integration of environmental objectives with innovation support, characteristic of Scandinavia, produce measurably different green innovation outcomes than India's parallel but largely un-integrated regimes?

II. Research Objectives

- To map and compare the legal and institutional frameworks governing green start-ups in India and Scandinavia, including constitutional foundations, statutes, innovation instruments, financing mechanisms and disclosure regimes.

- To assess their effectiveness in promoting environmental innovation while ensuring ecological accountability, using illustrative indicators such as green patenting and emissions trajectories.

- To examine the doctrinal and judicial principles, precaution, polluter pays, public trust and sustainable development, that discipline green enterprises in each jurisdiction.

- To identify structural challenges, including access to green finance, compliance burdens, technology transfer constraints and scalability barriers.

- To formulate reform proposals for aligning promotional law with environmental regulation, drawing on each jurisdiction's comparative strengths.

[3]Mohsen Khezri, Assessing Entrepreneurial Ecosystems' Influence on Green Technology Innovation: A Cross-Country Analysis, J. Innovation & Knowledge (2025).
[4]Press Information Bureau, Government of India, India's Startup Revolution (Feb. 2025).
[5]OECD data as cited in authors' abstract, Governing Green Start-ups (2026).

III. Research Methodology

The study adopts a mixed doctrinal and empirical comparative design, executed through the functional method of comparative law, under which institutions are compared by the social functions they perform rather than by their formal labels.[6] The units of comparison are therefore functions: financing green innovation, conditioning enterprise conduct on environmental accountability, incentivising green technology development and disciplining non-compliance.

The doctrinal component analyses constitutional provisions (Articles 21, 48A and 51A(g) of the Constitution of India and Scandinavian equivalents), the environmental and climate statutes of each jurisdiction, innovation instruments (the Startup India Action Plan 2016 and Scandinavian green transition programmes) and international instruments (the Paris Agreement, the SDGs and the EU Circular Economy Action Plan).

The empirical-illustrative component draws on published secondary data: OECD patent and emissions statistics for Denmark and Government of India data on DPIIT recognition and green-related schemes. These data contextualise doctrinal findings rather than sustain statistical inference; the study does not claim causal identification. Each jurisdiction is evaluated against a common grid: (i) promotional instruments; (ii) environmental conditionality attached to enterprise conduct; (iii) integration mechanisms linking the two; (iv) accountability and disclosure regimes; and (v) enforcement through courts and regulators. Limitations include treating Denmark, Norway and Sweden as a grouping, reliance on published sources rather than field interviews, and a rapidly evolving regulatory landscape.

IV. Literature Review

The literature relevant to this study falls into four streams: scholarship on green entrepreneurship and its economic effects; scholarship on the regulation-innovation relationship; comparative environmental law scholarship on the study jurisdictions; and Indian environmental jurisprudence scholarship.

Green entrepreneurship. A growing empirical literature establishes green start-ups as distinct economic actors rather than a marketing category. Prokopenko et al. analyse green entrepreneurship models across regions, finding that creativity, strategic partnerships and

[6]Konrad Zweigert and Hein Kötz, An Introduction to Comparative Law (Tony Weir trans., 3d ed. 1998).

technology adoption drive green ventures, and that such models are associated with job creation and emissions reductions.[7] Sharma and Subha review the role of green start-ups in economic development, concluding that ventures applying eco-friendly technologies, circular economy principles and sustainable resource management have emerged as key drivers of a low-carbon economy, while identifying funding constraints, market competition and regulatory barriers as the principal challenges to their scalability.[8] Studies of survival probabilities add a striking finding: analysis of Italian innovative start-ups from 2009 to 2018 shows that green start-ups are more than twice as likely to survive as their non-green counterparts, with the authors linking this to regulatory benefits granted to sustainability-oriented ventures.[9] Bibliometric mapping of the field confirms that regulatory frameworks, consumer behaviour, financial mechanisms and technology are the recurring enablers of green firms.[10]

Regulation and innovation. Whether environmental regulation stimulates or retards innovation remains contested in the Porter hypothesis debate. Recent cross-country evidence advances the debate by modelling non-linearity: Khezri's panel smooth threshold regression across eighteen countries identifies a regulatory threshold of 1.89 at which regulation's effect on green technology innovation changes character, finding that GDP per capita and financial development foster green technology innovation but that overly stringent regulation can counteract these effects, and that balanced environmental regulation can counter entrepreneurship indicators that divert resources from green innovation.[11] This non-linearity is directly relevant to comparative design: it predicts that neither zero regulation nor maximal regulation is optimal, and that jurisdictions differ in where they sit relative to the productive threshold. Kwilinski et al.'s econometric study of EU countries from 2007 to 2022 demonstrates a strong positive correlation between entrepreneurship transformation and green economic development, and recommends that governments simplify green start-up formation and provide targeted financial and procedural support.[12]

[7]Prokopenko et al., supra note 1.
[8]Shubham Sharma and Raju Subba, Entrepreneurship and Sustainability: Analyzing the Impact of Green Startups on Economic Development, Innovation & Green Dev. (2025).
[9]Riccardo Gianluigi Serio, Maria Michela Dickson, Diego Giuliani and Giuseppe Espa, Green Production as a Factor of Survival for Innovative Startups: Evidence from Italy, 12 Sustainability 9464 (2020).
[10]S. Nandhini and G. Sowmya, Advancing Green Entrepreneurship: Bibliometric Insights into Sustainable Innovation and Global Collaboration, Discover Sustainability (2025).
[11]Khezri, supra note 3.
[12]Kwilinski et al., supra note 2, at 157-175.

Comparative environmental law. The Nordic environmental law literature documents a distinctive regulatory architecture. The Swedish Environmental Code (Miljöbalken, 1998:808) consolidates environmental regulation with the explicit statutory purpose of promoting sustainable development, establishes environmental quality standards binding permitting authorities, and governs the responsible reuse and recycling of raw materials and energy.[13] Comparative surveys of Nordic environmental law show Norway implementing key EU environmental legislation directly through the EEA Agreement, including the Waste Framework Directive and the Renewable Energy Directive, and maintaining a dedicated Climate Act,[14] while Danish environmental law proceeds through sectoral statutes under a coordinating Ministry of Climate and the Environment.[15] The green finance literature documents Scandinavian capital-market depth: Danish pension funds announced plans at the 2019 UN Climate Action Summit to invest EUR 46 billion in clean energy and climate between 2020 and 2030.[16]

Indian environmental jurisprudence. The Indian literature emphasises the judiciary's role in constructing environmental accountability. The Supreme Court's environmental doctrine, developed in Vellore Citizens Welfare Forum, M.C. Mehta and allied cases, imported the precautionary principle, the polluter pays principle and the public trust doctrine into Indian law.[17] Scholarship on municipal solid waste governance documents the judicial supervision of waste management following Almitra H. Patel, including the National Green Tribunal's continuing oversight of Solid Waste Management Rules compliance.[18] India-specific scholarship on innovation policy examines the National Innovation and Startup Policy 2019 as a vehicle for sustainable development, noting its promotion of green technologies, clean energy, water conservation and waste management as key start-up areas.[19]

The gap. Each stream is well developed, but they do not intersect. The entrepreneurship literature rarely engages legal doctrine; the comparative environmental law literature rarely engages start-up regulation; and the Indian jurisprudence literature does not ask how judicial doctrine bears on the incentives of early-stage green ventures. No existing study, to our

[13]International Energy Agency, Environmental Code (1998:808), Sweden (2023).
[14]Nordic Council of Ministers, Environmental Law and Procedure in the Nordic Countries (2023).
[15]Id.
[16]State of Green and Danish Ministry of Climate, Energy and Utilities, Financing the Green Transition (2020).
[17]Vellore Citizens Welfare Forum v. Union of India, (1996) 5 SCC 647.
[18]Almitra H. Patel v. Union of India, W.P. (C) No. 888 of 1996 (Supreme Court of India, Feb. 15, 2000); Compliance of Municipal Solid Waste Rules, OA No. 199 of 2014 (National Green Tribunal).
[19]Manjeet Kaur, The National Innovation and Startup Policy as a Vehicle for Sustainable Development (2025).

knowledge, comparatively evaluates the legal governance of green start-ups across India and Scandinavia as an integrated promotional-and-accountability problem. This paper addresses that gap.

V. International and Regional Mechanisms

International frame. The Paris Agreement places "making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development" among its objectives (Article 2) and commits parties to cooperation on technology development and transfer (Article 10). India's nationally determined contributions give domestic green entrepreneurship a treaty-anchored mandate, while Scandinavian climate acts operationalise Paris-aligned targets in binding national law. SDGs 7, 8, 9 and 12 define the niche green start-ups occupy, and India's National Innovation and Startup Policy 2019 explicitly aligns entrepreneurship policy with them.[20]

EU framework and soft law. Because Denmark and Sweden are EU members and Norway implements key EU environmental legislation through the EEA Agreement,[21] the EU circular economy framework is functionally part of the Scandinavian start-up environment: the 2015 Action Plan, "Closing the Loop," committed the Union to revised waste legislation, circular design requirements and an innovation-deal pilot, with Horizon 2020 funding of over EUR 650 million.[22] Soft law also structures start-up finance: Scandinavian ventures face EU-harmonised disclosure, while Indian ventures face an evolving regime anchored in SEBI's business responsibility and sustainability reporting framework for larger listed entities.

VI. National Mechanisms

A. India: Promotional Law Without Environmental Conditionality

Constitutional and statutory foundations. Article 21 has been read to include the right to a wholesome environment, Article 48A directs the State to protect the environment, and Article 51A(g) imposes a fundamental duty on every citizen to do so. The statutory framework comprises the Environment (Protection) Act 1986, the Water Act 1974, the Air Act 1981 and

[20]Id.
[21]Nordic Council of Ministers, supra note 14.
[22]European Commission, Closing the Loop - An EU Action Plan for the Circular Economy, COM(2015) 614 final (Dec. 2, 2015).

the National Green Tribunal Act 2010, with sectoral waste rules including the Solid Waste Management Rules 2016 and the Plastic Waste and E-Waste rules. For a waste-management start-up these rules are not background law but the market, determining the commercial space available to private innovators.

The Startup India framework. The promotional pillar is Startup India, operationalised through the Action Plan of 16 January 2016, with nineteen action items spanning simplification, funding and incentives, and industry-academia partnership.[23] The Fund of Funds for Startups (corpus Rs. 10,000 crore) had by December 2024 catalysed investments of Rs. 21,276 crore in 1,173 start-ups,[24] and the Seed Fund Scheme had approved 213 incubators and benefited 2,622 start-ups.[25] Further support includes credit guarantees, tax exemptions and patent-fee rebates.[26] Recognition grew from around 502 start-ups in 2016 to 157,706 by December 2024, with over 17.28 lakh direct jobs reported.[27]

Sectoral green mechanisms. FAME-II (Rs. 11,500 crore), PM E-DRIVE (Rs. 10,900 crore) and the PLI schemes for automobiles (Rs. 25,938 crore) and advanced chemistry cell batteries (Rs. 18,100 crore) finance green mobility and storage directly,[28] while the National Innovation and Startup Policy 2019 channels innovation toward clean energy, water conservation and waste management.[29]

The gap. Promotional law and environmental conditionality run on separate tracks. Startup India's eligibility criteria reward innovation, turnover and entity age, not environmental performance, and its environmental content is confined to self-certification under the Water and Air Acts as a compliance simplification. Environmental regulation, for its part, applies to green start-ups identically to all other enterprises, without differentiation for scale, stage or technology risk. The result is promotion without green conditionality and regulation without start-up sensitivity, examined further in Part VIII.

[23]Department for Promotion of Industry and Internal Trade, Government of India, Startup India Initiative and Related Schemes.
[24]Press Information Bureau, India's Startup Revolution, supra note 4.
[25]Id.
[26]Press Information Bureau, Under the Startup India Initiative, Action Plan for Startups (2023).
[27]PIB, India's Startup Revolution, supra note 4.
[28]Ministry of Heavy Industries, Government of India, Lok Sabha Unstarred Question No. 453 (2026); PIB, Year End Review 2024: Ministry of Heavy Industries.
[29]Kaur, supra note 19.

B. Scandinavia: Integrated Environmental-Innovation Governance

Sweden. Sweden's Environmental Code (Miljöbalken, 1998:808) is the archetypal integrated code. Its purpose is to promote sustainable development; it applies to all operators of environmentally hazardous activities, requires permits for major activities and mandates evaluation of greenhouse gas impacts.[30] Chapter 5 sets environmental quality standards that permitting authorities must consider,[31] and Chapter 2 codifies general rules of consideration, including the precautionary principle and best available technology, that bind every operator. For a green start-up, accountability is therefore not a sectoral overlay but the unified legal environment, with predictable standards and a single permitting logic.

Denmark. Danish environmental law proceeds through sectoral statutes coordinated by the Ministry of Climate and the Environment,[32] and the Climate Act binds the state to emissions targets; the results appear in the indicators noted above, a 24% environment-related patent share in 2018 and 2020 emissions about 50% below 1990 levels.[33] The distinctive Danish mechanism is finance: pension funds announced plans in 2019 to invest EUR 46 billion in clean energy and climate between 2020 and 2030, conditioned expressly on the right policy frameworks, showing how promotional finance is coupled to green policy credibility.[34]

Norway. Norway implements key EU environmental legislation through the EEA Agreement and maintains a dedicated Climate Act (Lov om klimamål 2017).[35] Its Electricity Certificates Act created a green certificate market with quota obligations, and Norway adopted a carbon tax early, in 1991.[36] A non-EU state can thus import the EU regulatory demand structure that green start-ups require.

The integrated pattern. Across the three states the pattern is the inverse of India's: environmental regulation is comprehensive, binding and standardised, while promotional finance is smaller in scale but credible because of the regulatory environment, so that

[30]IEA, Environmental Code (1998:808), supra note 13; Swedish Environmental Protection Agency, The Swedish Environmental Code.
[31]IEA, Environmental Code (1998:808), supra note 13.
[32]Nordic Council of Ministers, supra note 14.
[33]OECD data, supra note 5.
[34]State of Green, supra note 16.
[35]Nordic Council of Ministers, supra note 14; LSE Grantham Institute, Norway: Climate Change Legislation.
[36]Id.

compliance becomes a source of business-model differentiation rather than an external constraint.

VII. Judicial Pronouncements Discussing the Laws

The judicial dimension is most developed in India, where the Supreme Court has built the doctrinal architecture binding all economic actors, including new enterprises, to environmental accountability.

Vellore Citizens Welfare Forum v. Union of India. Addressing pollution of the River Palar by Tamil Nadu tanneries, the Supreme Court held the precautionary principle and the polluter pays principle to be part of Indian law.[37] Scientific uncertainty must not postpone cost-effective preventive measures, and the polluter bears the cost of pollution and its restoration; both are features of the right to a healthy environment under Article 21.[38] For green start-ups, Vellore establishes that accountability is not deferred by technological uncertainty, a demanding standard for ventures commercialising immature technologies, and that the cost internalisation on which circular business models depend is binding doctrine. In 2024 the Court further recognised a "Government-Pay Principle" requiring the State to compensate where regulatory failure contributed to harm.[39]

M.C. Mehta: absolute liability and public trust. In the Oleum gas leak litigation the Court articulated absolute liability for hazardous enterprises, permitting no exception for safety diligence. In M.C. Mehta v. Kamal Nath it held the public trust doctrine to be part of the law of the land and enforced the polluter pays principle.[40] Green ventures in energy, storage, waste processing or chemicals handle precisely the hazardous processes to which absolute liability attaches, so these doctrines price environmental risk into green ventures more heavily than into conventional firms of equivalent size, an asymmetry that integrated permitting regimes avoid by pricing risk prospectively.

[37]Vellore Citizens Welfare Forum v. Union of India, (1996) 5 SCC 647; AIR 1996 SC 2715.
[38]Id.; see also Indian Council for Enviro-Legal Action v. Union of India, J.T. 1996 (2) 196 (recognising the polluter pays principle).
[39]Vellore Citizens Welfare Forum v. Union of India (contd.), Bajri Lease Loi Holders Welfare Society v. State of Rajasthan, 2024 SCC OnLine SC (Feb. 29, 2024) (LoEA awards and Government-Pay Principle).
[40]M.C. Mehta v. Kamal Nath, W.P. (C) No. 182 of 1996 (Supreme Court of India, May 12, 2000) (public trust doctrine and polluter pays).

Almitra H. Patel v. Union of India. The Court addressed the deplorable state of municipal solid waste management, issuing directions that catalysed the Municipal Solid Wastes Rules 2000 and ultimately the Solid Waste Management Rules 2016.[41] The litigation continues before the National Green Tribunal as OA No. 199 of 2014, which supervises compliance across urban local bodies.[42] For waste-sector start-ups, these judicially enforced obligations are the demand signals on which business models are built; Almitra is the clearest Indian illustration of courts shaping markets for green innovation, albeit indirectly.

The Scandinavian judicial context. Scandinavian accountability operates primarily through administrative permitting rather than public interest litigation; the Swedish Environmental Code establishes dedicated environmental courts,[43] while Norwegian and Danish implementation of EU directives channels accountability through regulator enforcement and EU supervision. Scandinavian green start-ups thus face accountability ex ante, through predictable permitting, while Indian ventures face it ex post, through tort-like doctrines and continuing mandamus supervision. Ex ante accountability lowers legal uncertainty but raises entry compliance costs; ex post accountability lowers entry barriers but raises tail risk.

VIII. Comparative Analysis and Findings

A. Comparative Frameworks

Figure 1 summarises the structural comparison, graded against the analytical grid set out in Part III. The systems present mirror-image strengths. India is strong on promotional finance (public outlays across start-up and green-mission schemes exceed Rs. 76,000 crore) and institutional innovation infrastructure, but weak on binding environmental conditionality within the promotional regime and on sustainability disclosure for early-stage ventures. Scandinavia is strong on all accountability dimensions and integrates regulation with innovation support, but its promotional instruments are smaller in direct fiscal scale, relying on regulation-driven demand and private green capital.

[41]Almitra H. Patel v. Union of India, W.P. (C) No. 888 of 1996 (Feb. 15, 2000).
[42]Compliance of Municipal Solid Waste Management Rules, OA No. 199 of 2014 (National Green Tribunal, Dec. 2, 2022).
[43]IEA, Environmental Code (1998:808), supra note 13.

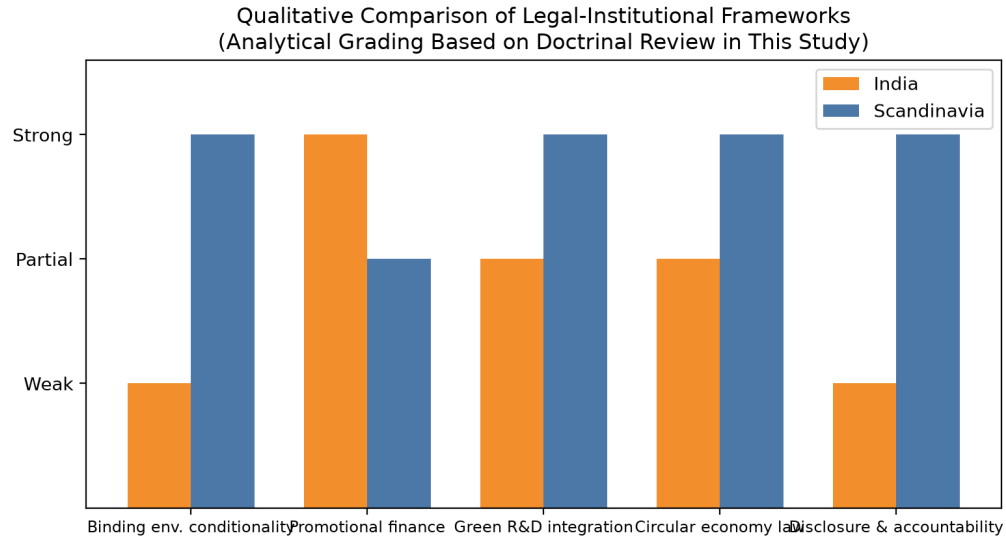


Figure 1: Qualitative comparison of legal-institutional frameworks governing green start-ups (3 = strong, 2 = partial, 1 = weak). The grading is analytical, not statistical.

B. Promotional Finance: Scale Versus Conditionality

Figure 2 illustrates the fiscal architecture of Indian promotion: the Fund of Funds (Rs. 10,000 crore), FAME-II, PM E-DRIVE, PLI-Auto and PLI-ACC collectively represent one of the largest public green-innovation financing programmes among developing economies.[44]

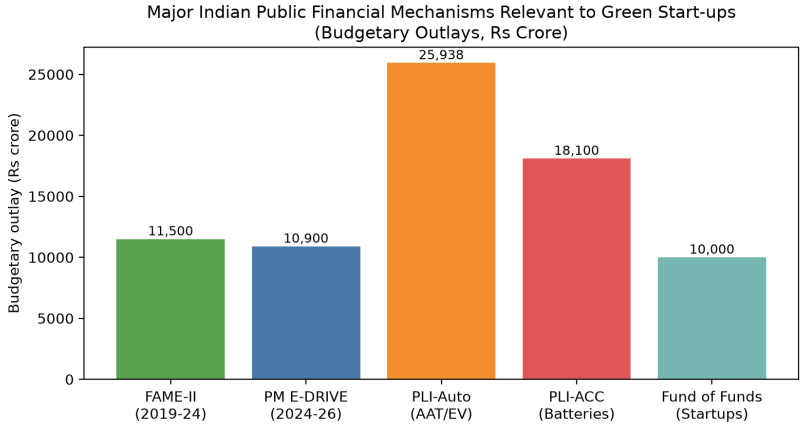


Figure 2: Major Indian public financial mechanisms relevant to green start-ups (budgetary outlays, Rs crore). Sources: PIB and Ministry of Heavy Industries releases cited in footnotes 24 and 28.

[44]PIB, supra notes 24, 28.

Three observations follow. First, scale is not the constraint; conditionality is. None of these instruments conditions support on environmental performance thresholds, lifecycle emissions criteria or circularity standards, whereas Scandinavian promotional finance, though smaller, operates inside a regime where EU state aid rules, green public procurement and disclosure obligations embed environmental criteria in capital allocation. Second, demand-side instruments such as FAME-II's vehicle incentives create markets without necessarily privileging green entrants, so the venture-level incidence of green promotion is diluted. Third, threshold analysis suggests that financing and government support have inverted U-shaped effects on green technology innovation, implying that unconditioned promotion may underperform promotion calibrated within a regulatory frame.[45]

C. Innovation Outcomes: The Danish Indicator

Figure 3 juxtaposes Denmark's environment-related patent share and emissions trajectory: environment-related technologies accounted for 24% of Danish patents in 2018, and 2020 CO2 emissions were approximately 50% below 1990 levels.[46] The Indian comparison is directional: start-up recognition grew from 502 to 157,706,[47] but green patent intensity and emissions trajectory per unit of innovation support are not tracked in an equivalent published indicator, itself a governance finding, the absence of an integrated green innovation metric in Indian promotional reporting.

[45]Khezri, supra note 3, at 14.
[46]OECD data, supra note 5.
[47]PIB, supra note 4.

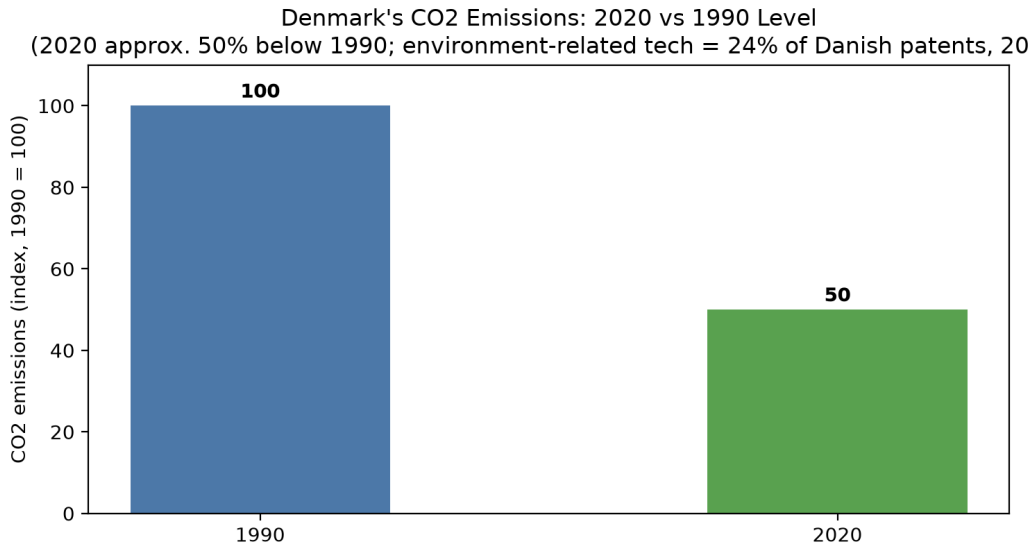


Figure 3: Denmark's CO2 emissions index (1990 = 100), with the 2018 environment-related patent share noted. Source: OECD data cited in the study abstract.

Denmark's decarbonisation occurred alongside, and plausibly partly because of, a high environment-related patent share, consistent with the Porter-hypothesis tradition. India's growth in start-up numbers demonstrates promotional efficacy in general entrepreneurship; whether it yields green innovation depends on variables the framework does not instrument, notably the environmental classification of recognised start-ups and the tracking of their green patenting.

D. Judicial Architecture and Enterprise Risk

Indian doctrines of absolute liability, precaution and polluter pays apply with full force to early-stage ventures handling hazardous or novel processes. The consequence is a legal environment in which entry is easy (self-certification) but operational liability is high and retrospective. Scandinavian ventures face the inverse: entry through unified permitting is demanding, but once permitted, liability is bounded by permit conditions, and standards change through notice-and-comment rather than judicial expansion.

Which design better serves innovation-led sustainable development? Khezri's threshold evidence suggests that regulation has a productive range within which it complements green technology innovation, while overly stringent enforcement can counteract the positive effects

of financing and government support.[48] On this reasoning, the Indian configuration sits below the productive threshold, promotion abundant and conditionality thin, so that incentives to innovate greenly are financial rather than regulatory; the Scandinavian configuration sits within it, with binding standards that convert compliance into market advantage. The pattern of Figure 3 is consistent with regulation within the productive range.

E. The Alignment Deficit and Reform

The central analytical conclusion is an alignment deficit: in both systems, but in different directions, promotional law and environmental law fail to constitute a single regime for green start-ups. India needs to graft environmental conditionality onto promotion: environmental performance criteria in DPIIT recognition categories, green-weighted seed fund allocation, lifecycle-based criteria in PLI schemes, and a green start-up classification reported annually alongside recognition counts. Scandinavia's lesson for itself is narrower but real: permitting timelines bear disproportionately on young firms, and streamlined green permitting lanes for start-ups would preserve accountability while reducing stage-insensitive compliance costs. Convergence is feasible because the underlying functions are the same; the functional method shows that India's scale and Scandinavia's integration are complementary rather than competing models.

IX. Conclusion and Suggestions

This study set out to compare the legal governance of green start-ups in India and Scandinavia and to ask whether innovation support and environmental accountability reinforce or undermine each other. Three findings answer the question.

First, the two jurisdictions embody inverted governance configurations. India couples massive promotional finance and institutional innovation infrastructure, over 157,000 recognised start-ups and sectoral green schemes exceeding Rs. 66,000 crore, with a promotional regime nearly devoid of environmental conditionality and an environmental regime undifferentiated by enterprise stage. Scandinavia couples comprehensive, integrated environmental regulation, exemplified by Sweden's Environmental Code, with promotional finance that is credible

[48]Khezri, supra note 3.

precisely because it operates within that regulatory frame, and with deep private green capital markets.

Second, judicial doctrine shapes green venture incentives asymmetrically. Indian jurisprudence, from Vellore through M.C. Mehta to the continuing NGT supervision under Almitra H. Patel, creates powerful ex post accountability that disciplines polluters and prices environmental risk into compliant green ventures. Scandinavian accountability is ex ante and permitting-based, trading higher entry compliance costs for bounded operational liability.

Third, the evidence is consistent with a threshold relationship between regulation and green innovation: Denmark's 24% environment-related patent share and emissions 50% below 1990 levels coexist with, and are plausibly supported by, binding standards within the productive regulatory range, while India's promotional intensity has not yet been instrumented to demonstrate equivalent green innovation outcomes.

Three suggestions follow For India; Introduce environmental performance criteria and a green start-up category into the Startup India recognition and funding architecture; require lifecycle-based environmental criteria in PLI and mobility schemes and publish annual green innovation metrics, such as green patent filings and green venture financing. For Scandinavia; create expedited green permitting lanes for start-ups without diluting standards. For both; institutionalise India-Scandinavia cooperation on green regulatory design, so that the alignment of promotional and environmental law is treated as a transferable governance technology rather than a regional accident.

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