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July 2026

Scaling Europe's clean-tech industry

*Lessons from East Asian startup-fuelled
industrial policy*

Imprint

Published by

Friedrich-Ebert-Stiftung e. V.
Godesberger Allee 149
53175 Bonn
Germany
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Issuing Department

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Cover image

AI generated image

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July 2026

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ISBN 978-3-98628-899-0

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Foreword

Concerns about economic resilience, energy security, technological dependence, and the green transition have pushed industrial strategy back to the centre of policy-making across the European Union. Clean technologies (“clean-tech”) are understood here as including new technologies such as batteries, carbon capture, electric vehicles, green shipping, hydrogen, renewable energy as well as the decarbonisation of energy-intensive industries, such as chemicals, steel, etc. Performance in both new technologies and future-proofing incumbent ones are now viewed not only as climate priorities but also as foundations of continued economic growth, industrial competitiveness, and strategic autonomy.

To compete in clean-tech, this paper argues that Europe’s challenge is not simply generating more innovation or creating more startups. Rather, it is ensuring that innovation translates into globally leading firms, resilient supply chains, and high-quality jobs. To achieve this, Europe should move beyond treating startup policy and industrial policy as separate domains and instead adopt an approach that connects startups and incumbent firms in shared strategic objectives.

Drawing on the [experiences of Japan and South Korea](#), the paper shows how startups can be mobilised as instruments of industrial upgrading rather than solely as disruptive challengers to established firms as the Silicon Valley model constitutes. The Japanese and Korean “secret” to industrial innovation performance is that their [governments actively create conditions in which startups inject innovative ideas, technologies, and talent into incumbent firms](#), while large firms can provide startups with capital, customers, production expertise, and routes to scale. This approach has helped sustain strengths in sectors such as batteries, advanced manufacturing, semiconductors, mobility, solar power, and high-tech shipbuilding. The paper identifies three core features of the East Asian model:

1. Startup support is aligned with national industrial priorities and strategic sectors.
2. Dedicated institutions foster collaboration between startups and incumbent firms.
3. Governments mobilise patient capital from governments themselves, banks, large corporations, pension funds, and stock exchanges to support startup growth and scaling *complementary* to incumbent firms.

These lessons are highly relevant for shaping policy to help propel Europe’s clean-tech ambitions. Policymakers should prioritise the development of ecosystems that strengthen connections between startups and established industrial leaders. The paper recommends that EU policymakers:

- Create clean-tech innovation hubs anchored by major industrial firms.
- Expand corporate venture capital and corporate-startup collaboration.
- Extend startup talent attraction initiatives and clean-tech skills development programmes modelled on successful East Asian programmes.
- Link startup support programmes to strategic sectors such as batteries, hydrogen, carbon capture, renewable energy, green shipping and industrial decarbonisation.
- Promote knowledge spillovers from foreign investment through partnerships.
- Strengthen European exit markets to help solve the “scale-up problem.”
- Use public procurement to accelerate the adoption of emerging clean technologies.

The core conclusion is that Europe’s industrial future depends not on choosing between startups and incumbent firms, but on creating productive complementarities between them. A European systems approach, combining entrepreneurial dynamism, industrial scale, and strategic coordination, offers the strongest foundation for achieving competitiveness, resilience, and sustainable growth in clean-tech industries in the decades ahead.

I.

Introduction: Europe's industrial policy moment

Industrial policy has returned to the centre of economic policymaking in Europe. Following decades in which market-led approaches dominated policy debates, governments across the EU are once again intervening more actively to shape economic growth and techno-industrial capabilities. The re-emergence of industrial policy comes as the need for state led intervention is more broadly recognised, given growing recognition that markets alone are unlikely to deliver the technological capabilities, production ecosystems, and economic resilience required. Concerns about economic resilience, energy security, supply-chain vulnerabilities, and technological dependence have pushed industrial strategy back onto the political agenda in both Brussels and national capitals. In addition, the twin pressures of geopolitical fragmentation and the climate transition have accelerated the urgency for action.

The clean technology sector sits at the centre of this renewed industrial policy agenda. The EU has set itself the target of becoming a global leader in the pursuit of [net-zero growth](#), advancing regulatory frameworks and investment programmes to support the development of renewable energy, batteries, electric vehicles (EVs), hydrogen technologies, and other strategic sectors. At the same time, policymakers face mounting concerns about Europe's ability to translate technological innovation into leading firms and industries. While Europe often excels at scientific research and technological invention, it has struggled to produce dominant firms in many of the industries expected to underpin future economic growth. In addition to new clean-tech industries, [the EU also aims to deliver decarbonisation and the continued strength of energy-intensive industries](#) such as chemicals, metals, and steel. The challenge is to decarbonise without disrupting existing strengths.

These concerns have become more acute as clean technology has increasingly become a domain of geopolitical competition. European dependence on external suppliers—[particularly China](#)—for solar panels, batteries, critical minerals, and EV-related technologies has raised questions about economic security and strategic autonomy. Russia's invasion of Ukraine exposed Europe's vulnerability to energy dependence, while continuing instability in key maritime trade routes and world energy markets has reinforced the importance of reducing reliance on imported fossil fuels. In this context, clean-tech development is no longer viewed solely as a climate policy objective; it has become central to debates about competitiveness, resilience, [security](#), and [sovereignty](#).

Recent efforts to foster European champions in strategic industries illustrate both the ambition and the difficulty of this task. The [bankruptcy of battery manufacturer Northvolt](#), despite substantial public and private support, has raised important questions about how industrial policy should be designed to build Europe's clean-tech capabilities. More broadly, it highlights the challenge of nurturing new industries that are sufficiently embedded within regional industrial strengths to benefit from supplier networks, skilled labour pools, growth financing, and market demand.

These debates point towards how Europe should organise industrial policy for its clean-tech sector. Much contemporary policy discussion treats startup policy and industrial policy as separate domains. Startup policies often focus on entrepreneurial skills, tax incentives to encourage firm creation, and the provision of venture and growth capital, while industrial policies traditionally centre on supporting established firms, manufacturing capabilities, and strategic sectors. Yet such distinctions may obscure the ways in which competing in international technology markets occurs.

This policy paper argues that a more integrated approach to industrial policy is required. Rather than viewing startups primarily as disruptive challengers to incumbent firms, policymakers should consider how startups can contribute to broader industrial prowess by injecting new technologies, business models, and innovative capabilities into existing economic systems. In clean technology, where scaling production, developing supply chains, and deploying infrastructure requires significant coordination, innovation depends not only on entrepreneurial dynamism but also on productive relationships between new ventures and incumbent firms. Said differently, a flourishing clean-tech startup ecosystem — characterised by productive linkages between startups, incumbent firms, finance, and public institutions — is a key indicator of inclusive, coordinated, and strategically capable industrial policy.

This perspective is particularly evident in Japan and South Korea. Drawing on insights from research in the context of our recent book, [Startup Capitalism](#), we show that East Asian industrial success has not emerged from isolated policy interventions but from systemic government coordination that brings incumbent firms and startups together. Startup capitalism can be understood as an

economic and political system in which startups contribute to employment, innovation, and growth. While the concept takes different forms across countries, Japan and South Korea have increasingly adopted approaches that position startups as a resource for, rather than replacements for, incumbent firms. Industrial policies are designed not only to support entrepreneurial activity but also to facilitate continuous technological upgrading across the wider economy, helping firms maintain and enhance their ability to compete in strategic sectors like high-tech shipbuilding, advanced manufacturing, and EVs.

Against this backdrop, the paper addresses three questions.

1. How does the East Asian industrial policy model, particularly in Japan and South Korea, function as a coordinated system linking the state, finance, and firms?
2. How are industrial policy instruments deployed to support startup scaling and infusing technological upgrading across the economy, particularly in strategic sectors?
3. What lessons can the EU draw from these experiences to design and implement more coordinated and scalable clean-tech industrial policy within respective policy and regulatory contexts?

To answer these questions, the paper examines how policymakers in Japan and South Korea have sought to foster complementarities between startups and incumbent firms. The objective of the paper is not to advocate for the wholesale transplantation of East Asian approaches into Europe. Differences in political systems, regulatory environments, and market structures make simple replication neither feasible nor desirable. Rather, the paper seeks to identify policy principles, mechanisms, and instruments that can be adapted to European conditions.

In doing so, it contributes to ongoing debates about how Germany and the EU can build more competitive, innovative and resilient clean-tech industrial ecosystems capable of supporting both economic performance and the green transition.

II.

Startup-fuelled industrial policy

A defining feature of contemporary industrial policy is the growing integration of startups into national innovation and production systems. [Startups contribute disproportionately to innovation](#), job creation, and productivity growth. They help commercialise emerging technologies, create new markets, and introduce novel business models. Rather than only disruptors, [they can strengthen incumbent firms](#) by supplying technologies, talent, and specialised capabilities.

One such example is the Korean Ministry of SMEs and Startup's new "Everyone's Challenge Climate Tech" initiative, which invites startups to solve the demand challenges faced by large corporations in terms of carbon neutrality, energy transition, and eco-friendly energy technologies. The initiative is run as a partnership across five public institutions (including the Ministry of Climate, Energy and Environment, including Korea Water Resources Corporation and Korea Electric Power Corporation) and three large corporations (including Hyundai Engineering & Construction and HD Hyundai Heavy Industries) to select startups that can inject climate technologies, such as AI and drones to monitor solar power generation and carbon emissions in manufacturing facilities. The startups receive ["technology verification, prototype production, and on-site applicability reviews together with demand firms, and will receive up to 140 million won in commercialization funding per task"](#).

The challenge offers a mechanism for startups to scale (by solving real needs faced by large corporations) and the large firms' ability to integrate frontier clean-tech.

Another example is how [Korea's leading shipbuilders collaborate with startups and universities to develop and integrate cutting-edge robotics and AI into their shipyards](#). Korean shipbuilders partner with AI and robotics startups because innovation at the frontier of autonomous shipbuilding requires combining complementary capabilities: shipbuilders provide industrial know-how, operational data, and live deployment environments, while startups contribute specialised expertise in AI, robotics, and digital twin technologies. [These collaborations](#) enable the integration of technologies that incumbent firms would struggle to develop internally and that startups could not commercialise at scale on their own.

Startup-oriented industrial policy can therefore be understood as a menu of complementary [open innovation](#) instruments designed to support startup creation, scaling, and injection into the broader economy. This approach distinguishes startup-fuelled industrial policy from traditional industrial policy, as illustrated in Table 1 in terms of the aims, target beneficiaries, and instruments used. The objective is not simply to create more new firms or boot ex-

Comparing industrial policy and startup policy

Table 1

	Industrial policy	Startup-oriented industrial policy
Aim	Boost economic competitiveness, export activity, and innovation capacity in specific sectors.	Fuel startup activity in technology-centric industries to bolster innovation capacity across the economy.
Target beneficiaries	Large incumbent firms mostly in manufacturing, tradable sectors.	High-growth, technology-oriented startups or potential founders of such firms, investors (VCs, angels), as well as large firms.
Instrument used	→ Funding: loans and working capital → Tax incentives and subsidies → Import and export controls	→ Funding: equity investment, grants and loans → Tax incentives and subsidies → Regulatory reforms → Education and training → Clusters and networks: accelerators and incubators → Stock market access → Attracting talent and investment → Public procurement

port activity, but to use startups as resources for driving technological upgrading, industrial renewal, and economic resilience. In some contexts, like [Japan and South Korea](#), incumbent firms remain central actors in startup-oriented industrial policy: as customers, investors, partners, suppliers, and acquirers. The result of this policy approach is an integrated innovation system in which startups contribute to the capabilities of the wider economy rather than as a separate, or disruptive, silo.

Startup policies comprise a range of instruments, beyond the availing of loans, tax incentives, and trade tools. These include funding vehicles such as grants, loans, public venture capital, and co-investment schemes; taxation policies that incentivise entrepreneurial activity, investment, and R&D; and regulatory reforms that lower barriers to entry, facilitate risk capital formation, and enable experimentation in emerging sectors. Governments also foster innovation through clusters and networks that connect startups

with universities and/or research centres, investors, and established firms, while talent attraction policies seek to draw and retain entrepreneurs, researchers, and skilled workers. Dedicated growth markets and capital market reforms improve stock market access and exit opportunities, while public procurement programmes create demand for innovative products and services. Finally, education and training policies build the entrepreneurial, technical, and managerial capabilities needed to sustain innovation-led growth over the long term.

Table 2 summarizes each policy type, including specific tools and examples from their implementation around the world: (1) Funding; (2) Taxation; (3) Regulation; (4) Clusters, Networks, Institutes; (5) Attracting Talent and Investment; (6) Stock Market Access; (7) Technology Infrastructure and Government Procurement; and (8) Education and Training.

Startup policy instruments, tools and examples

Table 2

Instruments	Tools	Examples
1. Funding	→ Grant, voucher, equity funding → Loans and credit guarantees → Tax credits → Fund of VC funds → Government VC fund → Co-investment fund	→ Fund of funds (Korea) → Future Fund (UK) → SBA Loans (US) → Technopreneurship Investment Fund (Singapore) → Yozma Fund (Israel)
2. Taxation	→ Tax incentives for investors and startups (e.g., preferential tax rate, tax exemption) → R&D tax incentives	→ Crédit Impôt Recherche (France) → R&D tax incentives (Korea) → Seed Enterprise Investment Scheme (UK)
3. Regulation	→ Licensing, permits → Bankruptcy law → Intellectual property rights → Regulatory sandbox → Pension fund rules	→ Regulatory sandbox (Korea, Malaysia) → Pension fund portability across employers (Korea, Japan)
4. Clusters and Networks	→ Accelerators and incubators → Co-working spaces → Innovation centres → Science and technology parks	→ Centres for the Creative Economy and Innovation (Korea) → Hsinchu Science Park (Taiwan) → 500 Kobe (Japan)
5. Talent attraction	→ Simplifying the migration procedure → Fast-track visa application	→ Finnish Startup Permit (Finland) → Global Startup Visa (UK) → Startup Chile (Chile)
6. Stock market access	→ Establishing stock markets serving startups → Foreign exchange dual listing.	→ BME Growth (Spain) → KONEX (Korea) → NASDAQ (US)
7. Public Procurement	→ Public contracts budget and guidance targeting small firms.	→ Startup-in-residence program (Netherlands) → Startup Strategy (Germany)
8. Education and Training	→ Entrepreneurship skills training (business plan and pitching) → STEM education	→ CanCode (Canada) → Mandatory computer coding education (Korea)

Our research reveals how large firms are often intended partners for governments delivering the startup policies, and in some ways, [beneficiaries of the efforts](#). Incumbent firms are involved in the provision of startup policies; as judges and mentors in accelerators and competitions, as licensing targets for programs that strive to attract entrepreneurial talent, as prospective equity investors in venture capital rounds, and ultimately, as prospective acquirers of scale-ups. Through participation at startup events, by hosting entrepreneurs on secondments, by making venture capital investments, and more, [incumbent firms can benefit](#) from infusing innovative ideas and talent into their organizations. This access can help boost their creative culture, bring in new technologies, bolster talent retention, and access new clients as startups comprise customers as well as partners for large firms.

III.

The East Asian model: injecting innovative DNA in the system

Japan and South Korea demonstrate how startups can be mobilised not as standalone disruptors, but as complementary actors within established industrial systems. Both countries are global leaders in sectors such as advanced manufacturing, batteries, mobility, semiconductors, robotics, and shipbuilding. Yet unlike the Silicon Valley model, which is stylised as celebrating startups for challenging incumbent firms, the [Japanese and South Korean approaches seek to “inject startup DNA”](#) into the commanding heights of industry, as one South Korean policy official told us. Startups are expected to bring new technologies and innovative talent into the system, while established firms provide capital, customers, production expertise, and transnational distribution channels.

The policies implemented by Japan and South Korea work particularly well due to continuity across governments. In both cases, new governments taking office have maintained previous successful policies or built on them to launch their own – which have then been maintained by subsequent governments. In other words, startup-fuelled has become depoliticised and there is a political agreement that serves the interests of the country as a whole. This is particularly important in the case of South Korea, where right-leaning and left-leaning governments alternate in office.

The result is a model of startup-fuelled industrial policy in which startups act as vehicles for technological upgrading across the wider economy. Rather than policy viewing startups and incumbents as separate, or even as competitors, policymakers actively create mechanisms through which they collaborate. Incumbent firms participate as acquirers, customers, investors, mentors, and procurement partners, while governments provide funding, coordination, incentives, and physical space that encourage these relationships. We distil three features.

First, startup support is explicitly linked to national industrial objectives. Rather than supporting entrepreneurship in general, governments target startups operating in sectors viewed as strategically important for future industrial paradigms. Japan’s [J-Startup Initiative](#) illustrates this approach. Launched in 2018 by multiple government bodies, including the Ministry of Economy, Trade and Industry (METI), the Japan External Trade Organization (JETRO), and the New Energy and Industrial Technology Development Organization (NEDO), the pro-

gramme identifies high-potential startups operating in sectors aligned with Japan’s industrial priorities, including artificial intelligence, clean technologies, healthcare, robotics, and advanced manufacturing. Selection is undertaken with in line with “Japan Inc.,” which refers to the close alignment between the Japanese government, industry, and finance in coordinating economic development. The selected startups receive help with publicizing, assistance in exhibiting in overseas missions, and crucially, through [“business matching”](#) which comprises connecting the individual startups “to executives of large firms, ministries and agencies).” In this way, the government-run J-Startup Initiative has large firms, banks, investors, and industry experts connecting with participating startups. This connectivity piece helps build the startups’ networks that will offer future fundraising potential, proof of concept and pilot opportunities, and distribution channels. The objective is not simply to create more startups, but to cultivate firms capable of growing at scale, going international, and in the process, strengthening Japan’s industrial leaders’ access to emerging technologies.

South Korea’s [Centres for Creative Economy and Innovation \(CCEI\)](#) represent one of the clearest examples of aligning with national industries. Established across the country, the centres connect startups with regional industrial strengths, venture capital investors, universities, and large corporate partners. Each centre is focused on a sector that reflects local capabilities. In [Ulsan](#), for example, Hyundai Heavy Industries serves as a key partner, supporting startups working on technologies relevant to shipbuilding and maritime industries.

This model is particularly relevant for clean technology. As international shipping faces pressure to decarbonise, innovation increasingly depends on the integration of artificial intelligence, robotics, digital twins, hydrogen technologies, and advanced materials into existing shipbuilding capabilities. Startups contribute these emerging technologies, while large firms provide production capacity, engineering expertise, and access to markets. The result is not disruption of the shipbuilding sector, but its technological upgrading. South Korea’s shipbuilders, led by firms such as Hyundai Heavy Industries and Samsung Heavy Industries, now possess capabilities that are exceptionally difficult to replicate. In particular, the construction of liquified natural gas (LNG) carriers and high-tech, productive shipyards. South Korea lever-

ages its shipbuilding prowess as a [“niche superpower”](#): a country that dominates a critical technology or supply-chain node on which today’s great powers depend. This has made Seoul a vital partner for Washington as the U.S. tries to rebuild its commercial and naval shipbuilding capacity. So much so that the Korean government launched its [“Make American Shipbuilding Great Again” \(MASGA\) initiative](#) in August 2025, bringing its leading know-how to American shipbuilding as part of wider strategic cooperation discussions.

Second, both countries have developed industrial policies specifically designed to foster collaboration between startups and established firms. South Korea’s [K-Startup Grand Challenge](#) offers a clear example. Established by the government in 2016, the programme attracts startups through funding, mentoring, and market access support. Importantly, success is often measured by partnerships, licensing agreements, and commercial relationships with major South Korean firms such as Samsung, Hyundai, LG, and SK. Startup growth aims are linked directly to integrating into the country’s lead firms to [bolster their industrial upgrading capabilities](#). Japan has pursued a similar strategy through [open-innovation programmes](#), cluster initiatives, and corporate-startup matching schemes that connect new ventures with large manufacturers, research institutes, universities, and regional governments. The objective is to create systems in which startups can boost the renewal of established industries.

Third, both countries have sought to channel the resources and expertise of incumbent economic actors into startup financing. In Japan, policymakers have encouraged established firms to acquire and partner with startups through measures such as tax incentives for mergers and acquisitions, recognising mergers and acquisitions (M&A) as an important means for propelling technology diffusion and startup scaling. The Japanese government has also worked to broaden the pool of available risk capital by encouraging institutional investors to enter the venture capital market. A notable example is the involvement of [the Government Pension Investment Fund \(GPIF\), the world’s largest pension fund, in venture capital and private equity investments](#), helping to legitimise venture investing as an asset class and expand the supply of patient capital available to startups. More recently, Japan has sought to position itself as a regional scale-up hub through initiatives by the [Tokyo Stock Exchange to attract unicorns from across Asia](#) to list in Tokyo. The strategy is designed not only to deepen Japan’s capital markets, but also to connect scaling firms with Japan’s distinctive set of long-term (patient) investors, including major banks and corporate partners. South Korea has pursued a similar approach. Regulatory reforms in 2020 expanded [the ability of the chaebol](#), which are large, often family-controlled South Korean conglomerates such as Hyundai and Samsung, to operate corporate venture capital funds and invest in

startups. This enabled the country’s industrial leaders to finance entrepreneurial ventures while systematically accessing new ideas, technologies, and talent from the startup ecosystem.

In both countries, the objective is not simply to increase the supply of capital, but to create stronger links between startups and established firms, allowing new technologies and business models to diffuse more rapidly throughout the wider economy. The relevance of this model is particularly evident in clean technology. Battery production, electric mobility, hydrogen, advanced manufacturing, and energy-efficient transportation require capabilities that no single firm can develop alone. Success depends on [collaboration across startups, scale-ups, and established industrial leaders](#).

South Korea’s battery industry provides a useful example. Firms such as LG Energy Solution and Samsung SDI remain internationally leading not only because of their own R&D investments, but because they operate within broader innovation systems that encourage collaboration with suppliers, startups, universities, and research centres. Similarly, efforts to develop [hydrogen-powered shipping](#) build upon partnerships between startups introducing new technologies (e.g., digital twins and AI robots) and incumbent firms capable of deploying them at industrial scale.

The broader lesson is that Japan and South Korea do not treat startup policy as separate from industrial policy. Startups are intentionally *embedded* within strategic sectors, regional clusters, and incumbent-led production systems. Governments use accelerators, clusters, funding, mentorship, procurement, and partnership programmes to connect entrepreneurial firms to national industrial priorities. In doing so, they preserve the advantages of large firms, including access to finance capital, manufacturing expertise, and wide distribution channels, while using startups to introduce experimental mindsets and technological novelty.

Table 3 (see p. 11) summarizes the benefits derived through various Japanese and South Korean startup-oriented industrial policies.

Certainly, there are potential drawbacks to the strategy pursued by Japan and South Korea. To begin with, critics would point out that promoting startup-large firm collaboration can prevent the emergence of new challengers and merely serve the interests of large corporations. Innovation may simply be complementary to existing industry, rather than transformative. Critics would also suggest that the government is indirectly supporting large incumbents under the guise of promoting entrepreneurship and startups. Another bigger, overarching criticism could be that the state, simply put, should play no role in promoting startup-large firm cooperation—or competition—beyond setting a regulatory

Strategic benefits	Forms of involvement	Japanese and Korean government selected initiatives and policies (year launched)
Access to innovative ideas	→ Accelerator or incubator sponsor or host → Cluster development (incumbents, startups, universities) → Co-working space / campus → Corporate development / M&A → Incubation and accelerator facility sponsor or host → Investment (encouraged by tax incentives) → Judge of startups in business plan competitions	→ Japan: 5-year startup plan (2022) target for acquisition of startups, J-Startup Initiative (2018) selection of participating startups, encourage M&A through tax incentive (2018), 500 Kobe (2016) with SMBC as key supporter, open innovation tax credit (2015) → Korea: Deep-Tech Startup Package (2026), K-Startup Grand Challenge (2016), Centres for Creative Economy & Innovation (2014), Technology Incubator Program for Startups (TIPS) (2013), Korea Institute of Startup and Entrepreneurship Development (KISED) (2011), Act on the Promotion of Collaborative Cooperation between Large Enterprises and Small-Medium Enterprises (2005)
Access to innovative talent	→ Allowing employees to pursue internships or secondments at venture-backed startups → Enabling spin-offs → Networking, mentoring and advisory programs → Venture builders	→ Japan: Secondment at a startup (2018), J-Startup Initiative (2018) coaching and mentoring selected startups, Research on spin-off incentives (2003) → Korea: Youth Startup Academy (2011), Act on the Promotion of Collaborative Cooperation between Large Enterprises and Small-Medium Enterprises (2005), Brain Korea 21 (BK21) (1999)

framework to level the playing field. Plus, promoting collaboration between startups and large firms could be seen as nothing more than economic nationalism and protectionism.

While these criticisms may have their merits, the reality is that industrial policy is neither new, certainly not in the case of Japan, South Korea and other East Asian countries, nor is it going to disappear. If anything, industrial policy bringing together government, large firms and startups is bound to become more common as the U.S. and China pursue economic nationalistic strategies and other countries seek to replicate the success of Japan and South Korea, including the development of large industrial ecosystems. In fact, during our research fieldwork in Japan and South Korea, we witnessed firsthand that governments from regions such as the Middle East and Southeast Asia are sending delegations to both countries to learn more about their policies to develop their own versions.

For Europe, therefore, the central lesson is to recognise that startups can be most effective when integrated into broader industrial ecosystems. European policy has emphasized the need for startups to scale-up at home. Recent initiatives strive to enable starting and scaling in Europe. The [EU Inc.](#) is a proposed pan-European legal

framework enabling entrepreneurs to incorporate a company anywhere in the EU within 48 hours at minimal cost, and the [Scaleup Fund](#) is a multi-billion-Euro fund providing late-stage and growth capital to Europe's most promising companies in strategic technology sector. Both are focused on the scale-ups as high-growth firms. While the Scaleup Fund partners with private investors, [with EQT as the fund manager and fund co-investors including Allianz and Santander](#), amongst others, they could do more to link these scale-ups with the European industrial system. The private partners are financial services firms, not industrial leaders from sectors like chemicals, steel, or precision manufacturing that would partner with such initiatives in Japan and Korea. The challenge is therefore not simply to create more startups that scale locally, but to enable the startup to connect with incumbent firms to collectively strengthen capabilities in strategic sectors.

IV.

Translating lessons to Europe

We translate the Japanese and South Korean start-up-fuelled industry policy approach into four lessons for European policymaking to consider.

1. Europe does not need more startups (or scale-ups), it needs startups to better contribute to stronger industrial ecosystems.

One of the central lessons from Japan and South Korea is that startup policy is most effective when it strengthens existing industrial capabilities. Europe's challenge is not a lack of entrepreneurial activity. Rather, it is the difficulty of translating innovation into industry-leading firms and ecosystems. In sectors such as batteries, electric vehicles, hydrogen, green shipping, carbon capture, and renewable energy, policy-makers should focus on building systems that connect startups, large firms, investors, and universities. In addition to fostering scale-ups, an objective for the state should be to create pathways through which startups can inject new technologies into established industrial leaders.

The experience of the European battery sector illustrates this challenge. The collapse of Northvolt demonstrated that large-scale public support alone is insufficient if new firms remain disconnected from wider industrial ecosystems. East Asian battery leaders emerged within networks linking manufacturers, suppliers, universities, financiers, and government agencies. Europe's battery strategy should therefore focus not only on supporting new entrants, but also on fostering collaboration between startups and incumbent firms such as BMW, Mercedes-Benz, Siemens, Volkswagen, and energy companies seeking to build next-generation storage technologies. State-supported open accelerator programmes, such as the Startup Autobahn that Mercedes-Benz established, could offer a format for connecting innovative startups, automotive industry leaders, and their original equipment manufacturers. This interaction can help the industry leaders to access cutting-edge ideas and technologies that could be injected into the processes and products.

Similarly, green shipping presents an opportunity to emulate aspects of South Korea's Ulsan model. European shipbuilders, ports, energy firms, and startups developing hydrogen propulsion, AI-driven logistics, robotics,

and advanced materials could be connected through dedicated innovation clusters and accelerator programmes focused on maritime decarbonisation.

The Green Deal Industrial Plan announced in 2023, together with subsequent initiatives such as the [Net-Zero Industry Act \(NZIA\)](#), the [Clean Industrial Deal](#), the [European Innovation Act](#), the [European Startup and Scale-up Strategy](#), and the proposed [Competitiveness Fund](#) and [Industrial Accelerator Act](#), signals the EU's growing recognition that industrial transformation requires more than carbon pricing and market incentives. The initiatives strive to boost competitiveness *and* decarbonisation through fostering co-location, as in [Net-Zero Acceleration Valleys](#). They aim to (physically and operationally) bring together industry and academia, on the one hand, and to crowd-in private investment to scale European startups, on the other. These initiatives are complemented by sector-specific instruments, including [Important Projects of Common European Interest \(IPCEIs\)](#), the [European Battery Booster](#), the [Critical Raw Materials Act](#), and the [European Defence Industry Programme \(EDIP\)](#), all of which seek to strengthen strategic value chains, scale domestic production, and mobilise private investment in particular verticals or aspects of supply chains.

Taken together, these measures move the EU closer to a strategic, whole-of-system clean-tech industrial ecosystem approach. They increasingly recognise the importance of coordinating innovation, manufacturing, supply chains, finance, and entrepreneurship across strategic sectors. However, compared with Japan and South Korea, Europe's approach remains fragmented across policy domains, funding instruments, and member states. Most notably, it lacks a systematic framework for connecting startups with incumbent firms. While scale-ups benefit from a range of funding mechanisms and established industries receive support through decarbonisation initiatives and university partnerships, relatively little attention is paid to fostering collaboration between the two. As a result, startups' innovative capabilities are not being purposefully injected into strategic industries, nor are scale-ups fully benefiting from the validation, market access, and scaling opportunities that incumbents can provide. Without stronger linkages between startups and industrial leaders, Europe will struggle to close the clean-tech gap with East Asia and the United States.

2. Build institutions that connect startups and incumbent firms

East Asian governments do not simply foster startups; they create conditions through which startups and large firms constructively interact. Europe already possesses many world-leading firms in industrial equipment, energy, automotive manufacturing, chemicals, and engineering. The challenge is to ensure that these firms systematically engage with startups. This could include sector-specific accelerators, corporate-startup matchmaking programmes, open innovation platforms, shared testbeds, and industry-led mentoring schemes. The objective should be to reduce the distance between startups developing new technologies and established firms capable of deploying them at scale.

Clean technology sectors are particularly suited to this approach because innovation often requires integration across complex value chains. Carbon capture technologies, for example, depend not only on technological breakthroughs but also on partnerships with industrial emitters, infrastructure providers, and energy companies. Hydrogen technologies similarly require coordination across production, storage, transport, and end-use applications. Europe should therefore invest not only in firms but also in programmes that help ensure incumbent firms' access to innovative ideas and talent.

At the EU level, the office of the [European Commissioner for Startups, Research and Innovation](#) and the [European Innovation Council](#) (EIC) would be the obvious combination of institutions specifically tasked with linking incumbent firms and startups. The [EIC board](#), for example, includes some European corporate leaders. It could consider a more proactive coaching and judging function between these board members and the funded companies, as well as a more concerted effort to have more industry leaders on the board, as the J-Startup Initiative has.

3. Mobilise finance for scaling and industrial transformation

One of the strengths of the Japanese and South Korean approaches is their ability to mobilise patient capital from a wide range of actors, including governments, pension funds, banks, stock exchanges, and large corporations. Europe continues to face a scale-up challenge. Many promising firms relocate abroad or seek foreign financing as they grow. Fragmented capital markets and limited exit opportunities constrain the development of Europe's share of global market leaders in key technologies. The London Stock Exchange as well as individual Euronext exchanges have been surpassed by the [South Korean](#) and [Taiwanese exchanges](#), for example.

The solution is not simply additional public funding, or to force pension funds to allocate to venture capital, as the Tibi Initiative in France and the UK's Mansion House Ac-

cord do. Rather, policymakers should seek to mobilise institutional investors and incumbent firms as active participants in local stock markets. Japan has sought to establish Tokyo as a destination for Asian scale-ups, with the [Tokyo Stock Exchange introducing measures to attract unicorns from across the region](#). Beyond strengthening domestic capital markets, this approach aims to embed high-growth firms within Japan's broader innovation ecosystem, linking them to patient investors, major banks, and corporate partners. Rather than relying on a sense of national duty as the motivation for Europe's pension funds, insurers, and banks to invest in late-stage rounds, the Japanese approach is to offer its large corporation good value investment opportunities and access to innovation through their initial public offering (IPO) purchases on the local exchange.

Several European initiatives already point in this direction. The UK's Seed Enterprise Investment Scheme (SEIS) stimulates investment in young firms by offering tax relief to investors who provide early-stage capital, helping startups overcome financing constraints during their formative years. Spain has similarly sought to improve scale-up pathways by simplifying stock market listing requirements for growth companies and reducing the costs associated with accessing public capital markets, with [BME Growth](#) and [BME Scaleup](#). Together, these initiatives recognise that entrepreneurial ecosystems require both early-stage finance and credible routes to growth and exit.

However, Europe's financial ecosystem remains fragmented. Greater coordination between stock exchanges, institutional investors, banks, and large firms could help create the patient capital needed to support firms in strategic sectors such as batteries, hydrogen, and renewable energy technologies. Such efforts could be spearheaded by organisations including Euronext, the European Commission, the European Investment Fund, and national development banks, working together to identify promising scale-ups and connect them with long-term sources of finance. As Japan's efforts to attract Asian unicorns to the Tokyo Stock Exchange demonstrate, capital markets can be used as instruments of industrial strategy rather than merely venues for trading securities.

In this respect, European policymakers should prioritise the capital mobility components of the ["One Europe, One Market Roadmap"](#) announced in March of this year. To begin with, the announced [EU Inc.](#) could serve as a step towards easier capital mobility targeting startups. There are several concerns, though. First, the 28th regime may not operate as [fully interoperable in practice](#), with national regulations subverting its easy-of-use and regional-scale value proposition. Second, there are concerns that it could [invite regime shopping to circumvent regulation and labour standards](#). One of the ways of ameliorating this 'race to the bottom' effect could be to limit the 28th regime's use to startups operating in specific, strategic sectors (so that established corporate groups don't

use it in the nefarious way). On the stock market bolstering, the exchanges in Amsterdam, Frankfurt and Paris would benefit from initiatives that attract unicorns to listing on these European markets as a means of accessing patient capital from the region's banks, industrial, and pension funds.

4. A playbook for responding to the China challenge

Recent European debates have often centred on reducing dependence on China through tariffs, local content requirements, and other defensive measures. Others have advocated a “reverse Deng” strategy, drawing on Deng Xiaoping's opening of China to foreign investment. In the European context, this would involve encouraging Chinese clean-tech firms to invest, manufacture, and form partnerships in Europe, thereby embedding advanced producers within European industrial ecosystems. [European firms already invest heavily in R&D, so their absorptive capacity](#) or their ability to take on knowledge transfer, is high. Policymakers should seek initiatives that maximise knowledge spillovers and capability development. Strategic partnerships, local hiring requirements, supplier development programmes, intellectual property or technology transfer requirements can help ensure that inward investment contributes to the development of domestic ecosystem capabilities.

Recent proposals, including provisions to attract foreign direct investment under the Industrial Accelerator Act (IAA), reflect elements of this approach by seeking to expand domestic production capacity and strengthen supply chains for decarbonisation in strategic sectors. While such measures may contribute to industrial ecosystem development, they are unlikely on their own to generate the EU's innovation capabilities needed for long-term competitiveness. As the experiences of Japan and South Korea suggest, competitiveness also depends on fostering productive relationships between startups and incumbent firms within the ecosystem.

Europe's experience in solar panels illustrates the danger. European firms were once leaders in solar technology but have struggled to maintain their market share as Chinese firms achieved scale, drove down costs, and continued investing in production capabilities. Similar concerns are now emerging in batteries and electric vehicles. EU policy needs to foster mechanisms for industry to remain cutting-edge, especially in decarbonising sectors and in emerging clean-tech industries. East Asian industrial policy demonstrates that maintaining their position at the leading-edge depends on continuously upgrading capabilities. Governments support collaboration between startups and incumbents encourage technology diffusion and investment in skills. This formula can foster industrial systems that remain globally strong, by continuing to innovate at the leading-edge.

The economic, political, and regulatory contexts in Japan, South Korea and Europe differ substantially. However, the underlying principle is transferable: startups are most valuable when they are embedded within broader industrial ecosystems. Industrial policy should therefore focus on enabling the financing and collaborative networks that allow the region's startups and incumbent firms to strengthen one another.

For Europe's clean-tech ambitions, the challenge is not simply generating innovation. It is ensuring that innovation translates into the persistent strength of lead firms, high-quality jobs, resilient supply chains, and technological leadership. Achieving these objectives will require a startup-fuelled industrial policy approach that places startup-incumbent collaboration, capability building, and industrial upgrading at the centre

V.

Policy recommendations

The experiences of Japan and South Korea suggest that startup-fuelled industrial policy is most effective when startups are embedded within broader industrial ecosystems. The objective is not simply to increase the number of startups, but to strengthen technological capabilities, industrial competitiveness, job growth, and economic resilience. While the contexts differ substantially between East Asia and Europe, several principles can guide the design of startup-focused industrial policy for Germany and the EU.

First, policymakers should prioritise ecosystem development over standalone interventions. Second, startup policy should be closely aligned with industrial priorities. Public support should focus on sectors where technological upgrading, economic resilience, and decarbonisation objectives overlap. In Europe, this includes batteries and energy storage, electric vehicles, hydrogen technologies, green shipping, renewable energy systems, carbon capture and storage, advanced materials, and industrial digitalisation. The goal should be to strengthen and modernize Europe's existing industrial base while creating opportunities for new firms to emerge. Third, public support should be designed to crowd in private investment, including from large corporations, for growth capital as well as exit routes. Fourth, responding to the China challenge is about more than protecting European markets. It could include mechanisms for diffusing know-how into Europe, into industrial systems anchored by large manufacturing firms. Table 4 summarises the recommendations.

Recommendation	Policy rationale	Key instruments	East Asian model and European application
1. Create clean-tech innovation hubs anchored by industrial leaders	Startups inject innovative ideas and talent into industrial ecosystems.	Clusters, accelerators, hubs, public-private partnerships.	Korea's Centres for Creative Economy and Innovation (CCEI). Develop regional clean-tech hubs, comprised of startups and incumbents, with strengths applicable to hydrogen, batteries, green shipping, and industrial decarbonisation.
2. Link startup support to strategic clean-tech priorities	Reinforce broader industrial competitiveness objectives.	Targeted grants, accelerators, challenge funds, public procurement.	Japan's J-Startup Initiative. Prioritise startups who AI, robotics, and other digital technologies can be applied emerging clean-tech and decarbonisation.
3. Expand corporate venture capital and corporate-startup collaboration	Large firms provide routes to scale while startups provide access to emerging technologies.	Tax incentives, co-investment schemes, corporate venture capital reforms.	Korean chaebol VC reforms and Japanese corporate VC programmes. Encourage European industrial leaders to invest in startups through tax incentives and conducive regulation.
4. Strengthen European exit markets	Startup ecosystems require credible pathways to scale and exit via corporate M&A as well as IPOs.	Stock market reforms, listing flexibility, growth markets, and corporate M&A tax incentives.	Tokyo Stock Exchange leverages Japan Inc.'s financial and industrial leaders to strengthen the offer of attracting unicorn listings. Improve the attractiveness of listing opportunities for high-growth firms across European exchanges.
5. Promote knowledge spillovers from foreign direct investment	Foreign direct investment should strengthen domestic capabilities and connectedness rather than operate as an enclave.	Accelerator programmes that introduce and encourage licensing and partnership agreements between foreign and local firms.	Adapted East Asian technology-transfer approaches, like the K-Startup Grand Challenge. Ensure inward investment in EVs, batteries, and renewables generates local knowledge spillovers (e.g., fosters partnerships with local firms).
6. Expand startup talent attraction programmes	Entrepreneurial and technical talent is globally mobile.	Startup visas, founder relocation schemes.	Startup visas attract entrepreneurial talent to Japan and Korea. Develop a European approach to attracting founders and engineers.
7. Establish a European clean-tech accelerator Initiative	Europe generates innovation but struggles to produce firms dominant in world markets.	Coordinated financing, mentoring, internationalisation support, procurement access.	European adaptation of Japan's J-Startup Initiative and Korea's K-Startup Grand Challenge. Support high-potential scale-ups across Europe by linking them with industry leaders for coaching, mentorship and pilots.

Conclusion:

toward a European systems approach

Europe's renewed embrace of industrial policy reflects a growing recognition that markets alone will not deliver the technological capabilities, productive capacity, and economic resilience required for the green transition. From batteries and electric vehicles to hydrogen, carbon capture, renewable energy, and green (high-tech) shipping, policymakers increasingly face the challenge of strengthening market performance while reducing strategic dependencies and accelerating decarbonisation.

This paper has argued that addressing these challenges requires moving beyond a fragmented view of industrial policy. Too often, startup policy and industrial strategy are treated as separate domains. The experiences of Japan and South Korea suggest that their effectiveness depends on a different approach: a coordinated system that connects startups and incumbent firms in shared strategic objectives.

The lesson from East Asia is not that startups are inherently superior to large firms, nor that entrepreneurial disruption should be pursued for its own sake. Rather, startups are most valuable when they are embedded within broader industrial ecosystems and able to “inject innovative DNA” into existing production systems and national strengths. Industrial policy plays a critical role in organising these complementarities through funding vehicles, regulatory frameworks, cluster development efforts, public procurement initiatives, and talent policies that facilitate and incentive connections between startups and established industrial leaders.

For Europe, the challenge is therefore not simply to create more startups or increase public spending on innovation. Europe already possesses world-class universities, research bodies, engineering capabilities, and industrial champions. The greater challenge is connecting these assets more effectively and creating pathways through which new technologies can be commercialised, scaled, and integrated into strategic sectors. The objective for state policy should be to build ecosystems that enable startups and incumbent firms to reinforce one another rather than operate, separately, in parallel.

As the EU seeks to strengthen its clean-tech industries through both emerging technologies and the decarbonisation of established sectors, the key question is not whether to support startups or incumbent firms, but how to foster productive complementarities between them.

Numerous European policies aim to boost scale-up capabilities and, separately, to sustain industrial competitiveness while decarbonising production. Yet few have systematically sought to connect technology-driven startups with industrial incumbents. Bridging this divide through a systems approach that combines entrepreneurial dynamism, industrial scale, patient capital, and strategic coordination will be essential to Europe's long-term competitiveness, resilience, and prosperity.

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Scaling Europe's clean-tech industry: lessons from East Asian startup-fuelled industrial policy

Europe's clean-tech future depends not on choosing between startups and incumbent firms, but on connecting their complementary strengths. Drawing on the industrial policy experiences of Japan and South Korea, this paper shows how a systems approach can foster collaboration to accelerate innovation in emerging industries such as batteries, carbon capture, and hydrogen, while helping decarbonise established sectors, including steel and chemicals. By aligning startup policy with industrial strategy, Europe can strengthen competitiveness, resilience, and sustainable growth.

Further information on the topic can be found here:

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