Global Innovation Index 2026

Innovation diffusion, deep science and the path from pilots to pipelines

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On 29 September 2026, WIPO launched the Global Innovation Index (GII) 2026 under the title "Powering entrepreneurs at the frontier of science." The GII ranks 139 economies by innovation performance and examines how innovation ecosystems translate scientific breakthroughs into scalable businesses and real-world applications. The two-hour launch focused on two related questions: where innovation capacity is emerging globally, and what allows frontier science to move from research to commercial scale. The 2026 edition placed particular emphasis on deep-science startups and spinouts.

Note: the economy rankings are the 2026 GII rankings. Many Global Innovation Tracker and deep-science statistics use 2025, the latest full year available when WIPO prepared the report; below, we specify the relevant period for each statistic.

The global innovation landscape: diffusion without uniform convergence

The launch presentation conveyed an overall message of widening but uneven geographic diffusion. WIPO speakers emphasized that the innovation frontier remains relatively stable, while a wider range of economies are developing capabilities through different regional and sectoral pathways.

Switzerland remains 1st in the 2026 ranking for a 16th consecutive year; Sweden ranks 2nd and the United States 3rd. At the same time, the frontier continues to change: the United Arab Emirates entered the top 25, while Canada (16th), Australia (20th) and New Zealand (24th) regained ground. WIPO linked these recoveries to stronger academic bases, university-industry links and research investment.

WIPO speakers focused on a group of middle-income economies that have made the strongest long-term advances since 2013: China, India, Viet Nam, Türkiye, the Philippines, Morocco and Indonesia. They described the catch-up as uneven and noted that it is easier on the production and trade side. The GII report's benchmarking exercise provides the fuller picture: production and exports show the strongest convergence, startup finance and IP show convergence to a lesser extent, while the domestic knowledge base and R&D converge much more slowly because research capacity takes longer to build.

WIPO therefore describes an innovation "glass ceiling" for middle-income economies: several climbers have become highly competitive in production, trade, digital services, startup activity and the use of IP, while still lagging high-income economies in deeper research and knowledge capabilities. China is the main exception. It ranks 10th overall and reaches high-income performance levels in 21 of 25 benchmarked indicators, combining commercial and production strengths with substantial research capacity and investment.

The GII also identifies innovation overperformers: economies that generate more innovation than their level of development would predict. In 2026, 21 economies overperform, four more than in 2025, and 10 of the 21 are lower-middle-income economies. Sub-Saharan Africa has the largest regional group, with seven: Rwanda, Malawi, Madagascar, Mozambique, Senegal, South Africa and Burundi. India and Viet Nam have overperformed for 16 consecutive years; Rwanda and Ukraine have each done so 14 times. The Republic of Moldova returned to the group in 2026, as did Mozambique and Pakistan, while Bhutan entered as an overperformer for the first time.

WIPO speakers stressed that there is no single recipe for innovation catch-up. India has advanced through digital services and venture capital; Viet Nam and the Philippines through high-tech manufacturing and participation in international trade and production networks; Türkiye through industrial design, branding and other intangible-asset capabilities; Indonesia through its large domestic market and startup finance; and Morocco through industrial capabilities and the use of IP, particularly designs and brands. The speakers identified the common long-term challenge as connecting these strengths to broader domestic research, firm capabilities and markets.

A changing conception of innovation capacity

The GII 2026 emphasizes that innovation capacity reflects an ecosystem, not simply a stock of isolated resources. It depends on an economy's ability to generate and absorb knowledge, connect research to firms and finance, deploy technology, commercialize it and convert innovation into productivity and wider economic value. WIPO's broader policy message is one of system coherence: strong individual pillars matter, but sustained performance depends on how well institutions, skills, infrastructure, finance, firms and markets reinforce one another.

The GII measures both the conditions that enable innovation and the results they produce. Its Innovation Input Sub-Index covers five pillars of enabling conditions; the Innovation Output Sub-Index covers two pillars of innovation results. The GII gives the two sub-indices equal weight in the overall score. The 2026 overperformers reinforce the distinction: income and resources do not mechanically determine outcomes, and some economies generate more innovation than their development level would predict.

Within the Business Sophistication pillar, the "Knowledge absorption" sub-pillar captures channels through which economies absorb and embed knowledge and technology. Its indicators include IP payments, high-tech imports, ICT services imports, foreign direct investment, research talent in businesses and, new in the 2026 framework, green-field R&D and high-tech FDI. The underlying idea is that innovation capacity includes the ability to acquire, adapt and deploy knowledge that others create, not only the ability to originate every technology domestically.

The launch also distinguished technology adoption from demonstrated economic impact. In 2025, global labor productivity rose 2.7% from 2024, above its 10-year average growth rate of 2.2%; the launch presentation noted that nearly 70% of economies recorded productivity growth above their own 10-year trend. Speakers highlighted the United States as both an AI-frontier economy and a country with strong productivity growth, but they cautioned against attributing the increase automatically to AI. They cited post-COVID labor-market recomposition as one alternative explanation, and the GII report itself notes that AI's aggregate productivity effect remains uncertain and may depend on complementary investment in data, skills and organizational change.

The rise of deep-science entrepreneurship and the role of IP

The GII 2026 special theme, "Powering Entrepreneurs at the Frontier of Science," examines how science-based ventures move from discovery to scale. Deep-science entrepreneurship refers to startups and spinouts in fields such as advanced materials, energy science, genomics, health technologies, quantum physics and synthetic biology. These ventures build on scientific discovery or tangible engineering innovation and typically require extended research, specialized infrastructure and rigorous validation.

By end-2025, the Dealroom-WIPO Deep Science Startup Tracker identified roughly 30,000 VC-backed deep-science startups and spinouts that entrepreneurs had founded since 2000, including inactive companies and companies that other firms had acquired. That cumulative count reached about 9.5 times the 2010 level, equivalent to compound annual growth of 16.2%. Deep science accounted for 16% of all venture-backed startups in 2025, a 15-year high. The Tracker recorded a combined enterprise value of about USD 7.6 trillion for these ventures in 2025, up 23% from 2024.

The sector mix is changing. Life sciences remains the largest field, with more than 11,000 tracked ventures, but its share of new deep-science startups fell from 55% in 2015 to 23% in 2025 as other fields grew faster. Semiconductors accounted for 23% of new deep-science startups in 2025, becoming the second-largest source of new ventures, while robotics and autonomous systems accounted for 17.6%.

Universities and research institutions are a particularly important source of deep-science spinouts in some fields. Among ventures that emerged since 2010, academic spinouts accounted for 42% in energy, 41% in life sciences, 37% in advanced materials and manufacturing, and 36% in medical devices and digital health. US institutions, including Harvard, MIT and Stanford, are behind 15 of the 20 most valuable deep-science spinouts that WIPO identified, while the most valuable individual spinout, semiconductor developer Cambricon Technologies, emerged from research at the Chinese Academy of Sciences.

The launch highlighted four features that distinguish deep science from software startups:

1. Longer development cycles. Validation, prototyping, regulatory approval, clinical testing, certification and manufacturing scale-up can span 5-15 years before revenue.
2. Higher capital intensity. Ventures may need wet labs, clean rooms, testing facilities, specialized equipment, pilot lines and manufacturing capacity before they can demonstrate product-market fit.
3. Interdisciplinary and changing teams. A venture may begin around researchers or inventors, but commercialization requires engineers, regulatory and quality specialists, process and manufacturing expertise, and commercial leadership.
4. Clear IP architecture. WIPO describes IP positioning as essential because collaboration, licensing and staged investment depend on defensible ownership and clear rights. During long pre-revenue periods, patents can also rank among the venture's few verifiable assets.

WIPO's patent analysis of deep-science startups from the 2010-2025 founding cohorts reinforces this point. Overall, 49.7% of deep-science startups hold patents, compared with 15.4% of non-deep-science startups. The gap has widened over the past decade. Patents can support investment, valuation, licensing, partnerships, freedom-to-operate planning and acquisition discussions; they can also define the boundaries of collaboration among universities, startups, manufacturers

and incumbent firms. At the same time, not every venture patents: some file later, while others rely more heavily on know-how, trade secrets or regulatory data exclusivity.

Patent use also rises with venture maturity. Patent holding increases from 42.7% at early stage to 60.8% at "breakout" stage and 69.2% at late stage; for non-deep-science startups, the corresponding shares are 10.3%, 20.2% and 37.5%. Sectoral differences are substantial. Medical devices and digital health is the most patent-intensive deep-science sector, with 57.8% of startups holding patents, while robotics and space rely relatively more on system integration, manufacturing execution, operational know-how, customer relationships and trade secrets.

The real bottleneck: from scientific validation to industrial scale

WIPO's central point is that deep-science ventures tend to stall at predictable transitions rather than at one single "valley of death": from research to investable proof-of-concept, from pilot to commercial deployment, and from working technology to a profitable venture. Scientific validation therefore represents only the first hurdle. A technology that works in the laboratory must still become a product that meets cost, reliability, quality, safety and manufacturing requirements at scale.

The report states that, in many fields, "industrialization, not invention" is now the binding constraint. Frontier technologies may require specialized laboratories, testbeds, metrology, pilot plants, clean rooms and bioprocessing capacity. A single startup may not be able to finance these large fixed investments. WIPO points to shared public or consortium facilities as a way to lower fixed costs and accelerate iteration. Financing cliffs also recur at the transition from research to proof-of-concept and, especially, from pilot to commercial deployment, where Series B and C rounds in the USD 20-100 million range can remain thin.

Capital alone, however, does not solve the problem. Even a venture with ample financing can fail if it lacks manufacturing capability, specialist talent, a clear regulatory route or customers. WIPO notes that gene editing, autonomous systems and AI in health care can face uncertain certification pathways; outdated rules may also inhibit testing. Demand uncertainty compounds technical risk: early customers may hesitate to adopt technology that has not yet proved itself in the market, and without credible demand, pilots can remain one-off demonstrations rather than become repeatable orders.

The panel discussion made the translation problem more concrete. Hisham Haddara, Chairman and CEO of Si-Ware Systems, described a progression from science to engineering to product to market. He emphasized that a prototype must ultimately meet cost, size and reliability requirements, and argued that marketing should not begin only after R&D ends: firms should engage potential customers while development teams continue their R&D work.

Kitty C. Liao, founder and CEO of IDEABATIC, similarly noted that technological advancement may not pose the hardest challenge in the journey; legacy regulatory frameworks can become a major obstacle. She also stressed the value of accelerator networks, manufacturing expertise and practical resources. Taken together, the panelists argued that technical development, customer validation, manufacturing input and regulatory planning should overlap rather than occur sequentially.

What an effective deep-science ecosystem requires

The policy recommendations follow. WIPO does not simply call for more startup support; it calls for a connected translation system that reduces different risks at different stages:

1. Diagnose where ventures actually stall. Policy should identify the specific transition that is failing and track downstream outcomes such as follow-on investment, rather than program counts alone.
2. Finance the full translation stack. Ecosystems need proof-of-concept funding, pilot and demonstration support, and later-stage patient capital. WIPO points to blended instruments such as matching funds, guarantees and first-loss structures.
3. Activate demand. Government procurement that sets functional requirements, along with offtake commitments and anchor-customer programs, can turn a successful demonstration into a financeable commercial project.
4. Build shared infrastructure. Shared labs, testbeds, pilot-manufacturing facilities and certification pathways can give startups access to capabilities that individual firms cannot afford to build.
5. Professionalize technology transfer and IP management. Clear ownership and licensing terms, capable technology-transfer teams and workable IP strategies can reduce friction between research institutions, founders, investors and industrial partners.
6. Create workable regulatory pathways. Regulatory sandboxes and clearer testing and certification routes can let new technologies demonstrate safety and performance while regulators update legacy rules.

WIPO also emphasizes translation talent: researchers need to work alongside engineers, manufacturing and quality specialists, regulatory experts and commercialization professionals. The broader lesson is that finance, infrastructure, IP, talent, regulation and demand are complementary. Strength in one area cannot fully compensate for a missing link elsewhere.

Conclusion: from pilots to pipelines

The WIPO presentation and panel discussion converged on a clear policy conclusion: the goal is to turn isolated pilots into repeatable pipelines. Speakers emphasized that governments, universities, investors, firms and regulators each address different parts of the same process, from generating research and clarifying IP to validating technology, financing scale-up, building production capability and creating routes to market.

That conclusion aligns with the GII report's broader message on innovation capacity: competitive innovation systems depend not only on how much they spend or how many individual assets they possess, but also on how effectively those assets connect. In the deep-science context, the speakers' takeaway was that frontier research creates value only when the surrounding ecosystem can move a discovery through proof, industrial scale and sustained market adoption.

GII AI Assistant

At the Global Forum on IP and AI on 10 November 2026, WIPO introduced its new GII AI Assistant. The side event demonstrated how the Assistant can make GII data and insights easier to access and explore, helping users navigate innovation performance and surface relevant findings from the Index.

Sources: WIPO, Global Innovation Index 2026; WIPO Global Launch, 29 September 2026; WIPO Global Forum on IP and AI, 10 November 2026.