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# Critical and Emerging Technologies Index 2025: Italy Report

## Executive Summary

Italy ranks mid-tier among the 26 nations and regional blocs investigated in the Critical and Emerging Technologies Index, trailing key EU peers like Germany and France but ahead of many other neighbors.

In advancing its capabilities, Italy can leverage the large resources of the EU Recovery Fund<sup>1</sup> as well as the recent European alignment on unprecedented investments to strengthen the defense ecosystem (ReArm Europe Plan<sup>2</sup>).

From the following analysis, few common insights emerge on what Italy must do:

- Institutionalize pathways from lab to market to convert intellectual leadership into global competitiveness.
- Mobilize higher private capital to scale innovation and sustain long-term tech competitiveness.
- Invest in both strategic infrastructure and human capital to gain autonomy and global influence in frontier technologies.

To address the gaps, Italy could follow the successful models of Germany's SPRIND<sup>3</sup> and the US's DIUx<sup>4</sup>, by initially strengthening the Deep-Tech division of Cassa Depositi e Prestiti (CDP) with the ultimate plan to establish an ad-hoc agency focused on advancing dual-use emerging technologies. Such a framework would foster dual-use technologies, driving disruptive growth in academia, industry, and government.

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1 European Commission, *Italy's Recovery and Resilience Plan*, May 2025, [https://commission.europa.eu/business-economy-euro/economic-recovery/recovery-and-resilience-facility/country-pages/italys-recovery-and-resilience-plan\\_en](https://commission.europa.eu/business-economy-euro/economic-recovery/recovery-and-resilience-facility/country-pages/italys-recovery-and-resilience-plan_en)

2 European Commission, *White Paper on European Defence and the Rearm EU Plan for Readiness 2030*, May 2025, [https://defence-industry-space.ec.europa.eu/eu-defence-industry/introducing-white-paper-european-defence-and-rearm-europe-plan-readiness-2030\\_en](https://defence-industry-space.ec.europa.eu/eu-defence-industry/introducing-white-paper-european-defence-and-rearm-europe-plan-readiness-2030_en)

3 Federal Ministry of Education and Research (Germany), *Federal Agency for Disruptive Innovation – SPRIND*, May 2025, [https://www.bmbf.de/EN/Research/TransferringResearchIntoPractice/FederalAgencyForDisruptiveInnovation-SPRIND/federalagencyfordisruptiveinnovation-sprin-d\\_node.html](https://www.bmbf.de/EN/Research/TransferringResearchIntoPractice/FederalAgencyForDisruptiveInnovation-SPRIND/federalagencyfordisruptiveinnovation-sprin-d_node.html)

4 U.S. Department of Defense, *Defense Innovation Unit*, May 2025, <https://www.diu.mil/>

# General Overview

Out of the 26 nations and regional blocs analyzed in the index, Italy ranks in the 14<sup>th</sup> position, well below other European peers like the United Kingdom, Germany, France, while being positioned above Spain and the Netherlands.

The positioning within the index is affected by a situation of under-performance in Quantum technologies. Italy stands in the upper part of the ranking in AI and Semiconductors, while occupying a medium position in Space technologies and Biotechnologies.

## Artificial Intelligence

### Status Quo

Italy is a rapidly growing AI ecosystem, driven by recent EU-wide initiatives. The country excels in AI research, is engaged in key global forums, and has a sophisticated regulatory framework enacted at both national and EU level through the AI Act. Italy ranks amongst the top 7 global countries for Top 500 supercomputers, with facilities like CINECA's Leonardo supercomputer (ranked 4th in Europe and 7th worldwide). However, Italy lags behind in AI commercialization, with venture capital (VC) investments in AI startups reaching only a fraction of those in France and Germany. The country has no major players in foundational machine learning (ML) models like LLMs or vision systems, and Italian AI startups have yet to scale internationally to compete with US, UK, or Chinese firms.

### Recommendations

- **Expand existing funding efforts with the PPP model** – Italy should evolve the existing €1 billion CDP-backed fund into a dedicated National AI Growth Fund, structured as a public-private investment vehicle modeled on France's "Tibi"<sup>5</sup> initiative and Germany's Zukunftsfonds.<sup>6</sup> The fund should attract institutional capital through de-risking mechanisms such as first-loss guarantees and tax incentives, with a focus on scale-ups and on developing large-scale foundation models, LLMs or vision models. These models should be built via public-private consortia involving top research institutions e.g., National Research Council of Italy - CNR, Italian Institute of Technology - IIT, access to sovereign computing infrastructure e.g., CINECA's Leonardo supercomputer, and private sector datasets from banking, telecom, manufacturing, and healthcare. Investment should be tied to commercialization outcomes, like patent filings, model performance, and international licensing, and aligned with European instruments such as InvestEU and the European Innovation Council (EIC).
- **Launch a national AI talent development program** – Building on the pilot AI education programs in schools as well as on the National PhD Program<sup>7</sup>, Italy should collaborate with schools, universities and companies to integrate AI-related courses at all levels of education and training programs.

5 French Treasury (Direction générale du Trésor), *Financing the Fourth Industrial Revolution*, accessed May 13, 2025, <https://www.tresor.economie.gouv.fr/banque-assurance-finance/financing-the-fourth-industrial-revolution>.

6 KfW, "KfW supports digitalisation strategy of the Federal Government with new promotional programme," press release, March 12, 2025, [https://www.kfw.de/About-KfW/Newsroom/Latest-News/Pressemitteilungen-Details\\_643072.html](https://www.kfw.de/About-KfW/Newsroom/Latest-News/Pressemitteilungen-Details_643072.html).

7 Italian National PhD Program in Artificial Intelligence, *AI & Society*, accessed May 13, 2025, <https://www.phd-ai.it/en/359-2/>.

Additionally, the government should create a dedicated “Brain Gain” track offering competitive relocation packages, startup capital, and fast-track academic or research appointments to Italian AI researchers abroad. Finally, AI-focused accelerators should be launched in key innovation hubs e.g., (Milan, Turin, Rom), offering spin-off support, tech transfer assistance, and international exposure.

- **Boost the investment in new AI infrastructure** – Italy should increase funding to enhance computing infrastructure and data repositories, offering subsidized cloud credits and testing environments to support research institutions and businesses. Investments should be designed to be interoperable with the Common European Data Spaces.<sup>8</sup> To further encourage uptake, the government should introduce AI adoption vouchers and fast-track procurement channels to pilot AI applications in public administration. These platforms should also be eligible to host regulatory sandboxes under the AI Act, where companies can test high-risk systems in a controlled environment.

## Biotechnologies

### Status Quo

Italy’s biotech sector is witnessing a strong development following the Covid-19 pandemic in 2020. The country has world-class human capital, translating into one of the highest global numbers of publications and milestones in the sector, e.g., in genetic engineering, biology, nuclear medicine, genomics, antibiotics, and synthetic biology. Despite its achievements, the country suffers from a low level of innovation in this field. The numbers in research publications do not translate into leadership in new patents. The level of funding, mainly private, remains modest compared to European peers (two times less than France, four times less than Germany). The regulatory environment remains very tight, with Italy banning or mostly prohibiting activities related to human and agricultural gene therapy and editing, as well as GM crops production.

### Recommendations

Given the breadth of the sector, the following recommendations should receive priority application in areas where Italy holds a potential strategic advantage and significant potential for economic return, in particular mRNA-Based Therapies and RNA Technologies, Microbiome Engineering and Synthetic Biology, Precision Medicine and Advanced Therapies.

- **Boost government and private funding** – The government should significantly increase public investment to levels comparable with the most advanced European economies (2-3x the current level) and strategically allocate these funds toward matching grants for university spin-offs and early-stage biotech startups. To further stimulate private investment, Italy should attract and facilitate VC funding through a combination of IPO incentives, R&D tax breaks and risk-tolerant co-investment mechanisms, drawing inspiration from the UK’s “Patent Box” regime.<sup>9</sup>
- **Launch a large commercialization program** – Italy must convert its strong research output into a higher number of patents by fostering a more effective innovation ecosystem. To achieve this, the government could introduce a performance-based funding mechanism that rewards successful

<sup>8</sup> European Commission, *Common European Data Spaces*, accessed May 13, 2025, <https://digital-strategy.ec.europa.eu/en/policies/data-spaces>.

<sup>9</sup> UK Government, *Corporation Tax: The Patent Box*, updated February 1, 2024, <https://www.gov.uk/guidance/corporation-tax-the-patent-box>.

commercialization outcomes by dedicated universities' technology transfer offices and facilitate licensing agreements or spin-off creation. Additionally, Italy should introduce outcome-based public procurement mechanisms to drive commercialization and implement expedited patent review processes for biotech-related applications, ensuring faster market entry and greater global competitiveness. A dedicated initiative, similar in spirit to the "Montalcini Global Biotech Tour"<sup>10</sup>, should incentivize participation in global biotech markets and events.

- **Implement regulatory reforms to boost innovation** – Italy should establish "Innovation Zones", close to high-potential clusters like Bioindustry Park Silvano Fumero in Piedmont for m-RNA therapies and Mirandola Biomedical District in Emilia Romagna for microbiome matters, to enable controlled biotech R&D testing and commercialization, fostering a dynamic environment for scientific advancement. A high-level bipartisan committee should revisit current bans on gene editing and GMOs, balancing ethical considerations with the economic and health benefits of innovation. Fast-track regulatory approval for biotech patents and clinical research as well as centralized competencies - currently split between ministries, agencies, and regions - would reduce administrative bottlenecks and stop the migration of Italian startups to the US.

## Financial Technologies

### Status Quo

Italy's fintech ecosystem has been gaining momentum over the last decade, but it remains smaller compared to major European fintech hubs such as the UK, Germany, or France. The fintech sector is experiencing a steep growth with over EUR 1B of total funding in 2023.<sup>11</sup> The country consistently ranks in the top positions for high-quality research publications. Italy is deeply involved in the definition of a European CBDC and is part of global agreements for the development of financial technologies. With respect to other peers, the Italian fintech ecosystem lacks a world class cybersecurity framework and suffers from a below-standard internet bandwidth.<sup>12</sup> While under development, the evolution of regulation for crypto-currencies remains limited.<sup>13</sup>

### Recommendations

In order to advance its position in the sector, Italy could benefit from the following actions:

- **Strengthen cybersecurity framework** – In line with EU DORA and NIS2 regulation, Italy should reinforce its cybersecurity framework including AI-driven fraud detection and automation measures for continuous monitoring and support fintech firms in applying zero trust architecture, encrypted APIs and strict third-party management.

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10 Italian Trade Agency (ICE), *Evento: Spazio e Innovazione – Prospettive 2025*, accessed May 13, 2025, <https://www.ice.it/it/area-clienti/eventi/dettaglio-evento/2025/@@/016>.

11 Banca d'Italia, *Indagine Fintech nel Sistema Finanziario Italiano* (Rome: Banca d'Italia, April 2024), <https://www.bancaditalia.it/pubblicazioni/indagine-fintech/2023/2023-indagine-fintech.pdf>.

12 Orizzonti Politici, "Dalla Copertura alla Velocità: L'Italia e i Divari nelle Telecomunicazioni," accessed May 13, 2025, <https://www.orizzontipolitici.it/divari-italia-telecomunicazioni/>.

13 Matteo Di Felice, "Fintech: Situazione e Prospettive in Italia e nel Mondo," *StartupItalia*, August 27, 2024, <https://startupitalia.eu/smartmoney/fintech-situazione-e-prospettive-in-italia-e-nel-mondo/>.

- **Accelerate the development of a comprehensive digital infrastructure** – Italy should accelerate the implementation of the plan “Digital Italy 2026” to ensure a high-speed internet infrastructure in Southern regions and rural areas by, e.g., collaborating with satellite platforms. This would create a higher user base for fintech firms increasing the appeal of the Italian market.
- **Support the creation of national champions and their internationalization** – In order to fill the gap with the UK, France and Germany, Italy needs to reinforce funding mechanisms for late-stage start-ups, enlarge regulatory sandbox applications and support the promotion and export of Italian fintech services to compete with their European peers.

## Semiconductors

### Status Quo

In recent years, the EU has launched major initiatives to narrow the gap with global leaders like the US and China in the semiconductor industry. Italy ranks second in the EU by number of companies operating in microelectronics, supported by a combination of foreign investments, joint ventures such as STMicroelectronics, and a robust ecosystem of SMEs spanning the entire value chain, mainly on the front-end side. Italy lacks large national players on below 10-nm fab, fabless, EDA, Assembly, packaging & testing sides.<sup>14</sup>

Italy enjoys a strong research ecosystem but limited new patents productions (approximately 3x less than France and 5x less than Germany). The government has been attempting to revive the industry with a EUR 4B investment in 2022 as part of the EU Recovery Fund and the creation of the Chips.IT Foundation hub at the University of Pavia.<sup>15</sup> It has a dedicated industrial program and is part of the main global institutions and councils for coordination and development e.g., the World Semiconductor Council (WSC) and the Trade and Technology Council (TTC).<sup>16</sup>

### Recommendations

In order to advance its position in the sector, Italy could benefit from the following actions:

- **Boost support for scaling of SMEs** – Italy should launch a dedicated co-investment fund - modeled on France’s “Electronique 2030”<sup>17</sup> and aligned with the Draghi report’s call for pooled EU-scale financing - to support scale-ups of high-potential semiconductor SMEs. This “SME Semiconductor Catalyst Fund” would provide targeted financing to SMEs working in strategic applications such as EVs, renewable energy systems, aerospace, and AI chips. To complement this, Italy should expand existing R&D tax credits for microelectronics and simplify their access, with a special emphasis on

14 AWARE – A World of Awareness, *L'Italia dei semiconduttori: Opportunità strategiche per una filiera europea* (Rome: AWARE Think Tank, June 2023), <https://www.awarethinktank.it/wp-content/uploads/2023/06/Giu2023-AWARE-Semiconduttori-Italia.pdf>.

15 Italian Trade & Investment Agency (ITA), *Microelectronics and Semiconductors in Italy*, accessed May 13, 2025, <https://www.investitaly.gov.it/en/sectors/microelectronics-semiconductors>.

16 Italian Ministry of Economy and Finance (MEF), *Nota Tematica n. 3/2023: Il ruolo della politica industriale nel rilancio degli investimenti pubblici e privati in Italia*, July 2023, [https://www.dt.mef.gov.it/export/sites/sitodt/modules/documenti\\_it/analisi\\_programmazione/note\\_tematiche/Nota-Tematica-n-3-2023.pdf](https://www.dt.mef.gov.it/export/sites/sitodt/modules/documenti_it/analisi_programmazione/note_tematiche/Nota-Tematica-n-3-2023.pdf).

17 French Ministry for Europe and Foreign Affairs, *France Relance: Recovery Plan – Building the France of 2030*, accessed May 13, 2025, <https://www.diplomatie.gouv.fr/en/french-foreign-policy/economic-diplomacy-foreign-trade/promoting-france-s-attractiveness/france-relance-recovery-plan-building-the-france-of-2030/>.

early-stage fabless companies, EDA developers, and photonics innovators. Structured public-private consortia should be encouraged, where large national firms like Leonardo, Ferrari, Enel, or TIM commit to co-investment and/or long-term procurement agreements with promising chip SMEs. This would create demand certainty, reduce market risk, and accelerate industrial validation.

- **Promote the development of targeted skills programs and accelerators** – In line with the “Tech Skills Acquisition Programme” proposed by Draghi’s report<sup>18</sup>, Italy should financially support existing excellence centres like Pavia University, Milan and Turin Politecnico to reinforce targeted scholarships and graduate programs in micro-electronics, providing accelerators and incubators opportunities for high-tech startups. These accelerators, involving European champions like STMicroelectronics, ASML, and Leonardo, should provide access to shared infrastructure, cloud-based design platforms (in line with the EU Chips Act’s Design Platform<sup>19</sup>), and structured IP generation fellowships that reward patent development and technology transfer.
- **Localize knowledge by attracting foreign investments** – Italy should build on its recent FDI successes, such as Silicon Box’s €3.2 billion packaging facility in Novara<sup>20</sup>, by implementing a targeted “Semiconductor Landing Pad” strategy. This initiative would offer tailored incentives e.g. fast-track permitting, tax credits, access to CHIPS.IT and regional hubs to attract fabless design firms, testing and assembly specialists, and EDA tool providers. The goal is to fill gaps in the semiconductor value chain while maximizing knowledge spillovers and strengthening domestic capabilities. To enhance this, the government should actively facilitate strategic partnerships between foreign investors and large national anchor buyers like Leonardo, Enel, and Fincantieri. These firms can provide long-term procurement guarantees and even equity co-investments to de-risk projects.

## Space Technologies

### Status Quo

Italy has a notable presence in the global space sector. It has been the fifth country in the world to have a machine in orbit (the San Marco I), played a significant role in the development of the International Space Station (ISS) and contributed with several astronauts, amongst them the first woman to lead the ISS, Samantha Cristoforetti. Italy’s powerful defense company, Leonardo, also partnered with other European companies like the French Thales to form the largest satellite manufacturer in continental Europe.<sup>21</sup> The country has a strong research and workforce base, with significant academic contributions to space technologies and being very active in contributing to new space missions. Italy is highly engaged in international space cooperation, participating in initiatives such as the Artemis Accords and Combined Space Operations (CSPO). It has also a major role in EU’s satellite navigation system Galileo.<sup>22</sup>

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18 Mario Draghi, *The Future of European Competitiveness: A Competitiveness Strategy for Europe*, European Commission, September 9, 2024, [https://commission.europa.eu/topics/eu-competitiveness/draghi-report\\_en](https://commission.europa.eu/topics/eu-competitiveness/draghi-report_en).

19 European Commission, *European Chips Act: The Chips for Europe Initiative*, May 2025, <https://digital-strategy.ec.europa.eu/en/factpages/european-chips-act-chips-europe-initiative>.

20 Reuters, “Silicon Box Picks Italy’s Piedmont Region for \$3.4 Billion Chip Plant,” June 28, 2024, <https://www.reuters.com/technology/silicon-box-picks-piedmont-region-its-italian-34-bln-chip-plant-2024-06-28/>.

21 Tim Marshall, *The Future of Geography: How Power and Politics in Space Will Change Our World* (London: Elliott & Thompson, 2023).

22 Eleonora Ardemagni, *Italy’s Space Strategy: Bridging Autonomy and International Cooperation*, Istituto Affari Internazionali, July 2023, [https://www.iai.it/sites/default/files/iai2321\\_en.pdf](https://www.iai.it/sites/default/files/iai2321_en.pdf).



Italy invests significant economic resources in space, out of them 88% coming from government funding and the rest from private sector funding. The economic involvement of the private sector remains very low if compared with other comparable players like France, Germany, UK whose private sector respectively contributes close or more than 50% of total space funding.<sup>23</sup>

Italy's security capabilities remain modest in terms of military-grade directed-energy weapons and jamming technologies. It lacks a major domestic orbital launch site, which limits its independent access to space and has a relatively small number of communication satellites in orbit.

## Recommendations

In order to advance its position in the sector, Italy could benefit from the following actions:

- **Boost the development of defense space startups through cash and non cash incentives** – Italy should adopt a strategy that combines financial incentives with structural reforms to support the growth of space startups. Drawing on successful models from Israel and the US, support for national champions like Leonardo must be paired with targeted measures to help early-stage companies flourish. In the inception phase, the government should simplify bureaucratic procedures and attract specialized venture capital through matching grants. To enable scale-up, awarding stable government contracts can boost startup credibility and facilitate expansion into other European markets. Finally, removing obstacles such as Italy's disproportionately high insurance fee i.e., operators must secure insurance coverage of up to €100 million per incident, significantly higher than in countries like France (€60 million), would reduce operational burdens and allow startups to channel scarce initial capital into high-potential R&D activities.<sup>24</sup>
- **Bolster defense-specific R&D for advanced space security capabilities** – Italy should leverage its long-standing expertise in observation and dual-use systems while intensifying investments in advanced directed-energy and electronic warfare prototypes. This strategy should be seamlessly integrated into the European Defense Strategy and NATO's Defence Innovation Accelerator for the North Atlantic (DIANA<sup>25</sup>) initiative. Effective implementation will require close collaboration between large corporations, SMEs and academic institutions to drive innovation and maintain technological leadership in the defense sector.
- **Accelerate the development of IRIS** – Italy needs to play a pivotal role in reinforcing the European alternative to Starlink, IRIS<sup>26</sup>, by complementing its security-focused infrastructure with a robust commercial offering, mirroring the approach of the US giant. To achieve this, Italy should actively support Leonardo and smaller industry players in securing a significant share of the satellite manufacturing (currently controlled mainly by France), ground-segment integration, and service provision market. This effort should be backed by procurement incentives and technology transfer programs, fostering innovation, industrial growth, and strategic autonomy within the European space sector.

23 AWARE – A World of Awareness, *L'ecosistema italiano dello spazio* (Rome: AWARE Think Tank, July 2024), <https://www.awarethinktank.it/wp-content/uploads/2024/07/LECOSISTEMA-ITALIANO-DELLO-SPAZIO-AWARE.pdf>.

24 AWARE – A World of Awareness, *L'ecosistema italiano dello spazio* (Rome: AWARE Think Tank, July 2024), <https://www.awarethinktank.it/wp-content/uploads/2024/07/LECOSISTEMA-ITALIANO-DELLO-SPAZIO-AWARE.pdf>.

25 NATO Defence Innovation Accelerator for the North Atlantic (DIANA), *Homepage*, accessed May 13, 2025, <https://www.diana.nato.int/>.

26 European Union Agency for the Space Programme (EUSPA), *IRIS<sup>2</sup>: Secure Connectivity*, accessed May 13, 2025, <https://www.euspa.europa.eu/eu-space-programme/secure-satcom/iris2>.

# Quantum Technologies

## Status Quo

Despite being an emerging player, Italy exhibits promising strengths in quantum technologies. The country boasts a strong academic and scientific ecosystem, with leading research institutions, universities, and national laboratories engaged in all areas: quantum computing (QC), quantum simulation (QS), quantum communication (QComm), and quantum sensing & metrology (QSM). The Italian academic system contributes significantly to European-level projects, aligning with major international initiatives like EuroQCI (Quantum Communication Infrastructure) and EuroHPC-JU (European High-Performance Computing Joint Undertaking). Italy holds recognized expertise in QComm, with startups such as QTI (Quantum Telecommunications Italy) leading in Quantum Key Distribution (QKD) solutions. The Agenzia per la Cybersicurezza Nazionale (ACN) and Istituto Nazionale di Ricerca Metrologica (INRIM) are at the forefront of integrating quantum cryptography into national security frameworks. Italy also excels in QSM, with applications in medical diagnostics, geophysical monitoring, and high-precision navigation. However, Italy suffers from significantly lower funding at both public (12% of French, <8% of German, <6% of UK government funding) and private levels (only 1-2% of respectively French, German, and UK VC investments in 2023). The country lacks dedicated quantum venture capital funds, has no mature domestic QC companies, and remains dependent on foreign quantum semiconductor foundries, posing IP risks. Infrastructure gaps include long wait times for QC access and the absence of a national quantum cloud. Additionally, Italy has no structured national quantum education program, unlike France, Germany, and the UK. Finally, governance is fragmented, lacking a centralized strategy to integrate research, industry, and funding, slowing down technological progress.<sup>27</sup>

## Recommendations

- **Strengthen research and infrastructure** – Italy needs to match UK, Germany and France when it comes to public funding efforts. Additional money should be dedicated to develop a national quantum computing cloud, integrating hybrid classical-quantum computing resources and providing on-demand access for universities, startups, and industry. In parallel, government efforts should finance the creation of a quantum innovation hub, with dedicated facilities for hardware development, software stack optimization, and technology transfer, to foster collaboration between academia and private sector players.
- **Promote industry participation and market development** – Italy should support early stage startups through its sovereign wealth fund CDP or a dedicated unit. A targeted tax incentive scheme should be introduced for private R&D investment in quantum computing, communication, and sensing, similar to the UK's R&D tax credits. The government should launch co-investment schemes with corporate players like Leonardo, STMicroelectronics, Eni, Enel, and TIM to de-risk early-stage quantum ventures. Additionally, a public-private accelerator should be established to support spin-offs from research institutions, ensuring Italy builds a robust quantum startup ecosystem.
- **Invest in education and workforce development** – The Ministry of Education should work with universities to design structured master's and PhD programs to build high-skilled human capital, work with large companies and startups to ensure the accumulation of meaningful work experiences,

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<sup>27</sup> Italian Ministry of University and Research (MUR), *Quantum Information Science: Master Plan for Consultation*, March 2025, [https://www.mur.gov.it/sites/default/files/2025-03/QIS\\_master\\_for\\_consultation.pdf](https://www.mur.gov.it/sites/default/files/2025-03/QIS_master_for_consultation.pdf).



modeled after Germany's Quantum Flagship Initiative<sup>28</sup>, and provide targeted incentives to retain talent, avoiding the brain drain towards other EU countries, and promote the local creation of quantum innovations and commercial applications.

## Governance Structure

Italy actively promotes innovation and funds emerging technologies through multiple entities, including ministries, CDP Venture, Fondo Internazionale Innovazione, and PNRR initiatives. However, the country lacks a centralized structure dedicated to long-term experimentation and strategic innovation.

A SPRIND-like Italian agency for high-risk, high-reward innovation would complement existing instruments, providing flexible funding, reduced bureaucratic constraints, and strong academic-industry collaboration. This approach would catalyze disruptive technologies while reinforcing industrial leadership and defense autonomy.

Given that setting up a new governance structure is a lengthy process, the government could take an interim step by strengthening the Deep-Tech division of CDP, while securing the necessary approvals to eventually spin off an independent entity— the Italian Emerging Technology Agency (IETA).

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<sup>28</sup> Matt Swayne, "German Flagship Project PlanQK Sets New Course Towards Economic Use for Quantum," *The Quantum Insider*, December 19, 2023, <https://thequantuminsider.com/2023/12/19/german-flagship-project-planqk-sets-new-course-towards-economic-use-for-quantum/>.