Israeli National Council for Civilian R&D
המועצה הלאומית למחקר ופיתוח אזרחי

The National Council for Research and Development (NCRD)

Annual Report 2024–2025

Research and Development (R&D) in Israel

1. Executive Summary

The annual report of Israel National Council for Civilian Research and Development (NCRD) for the year 2024 summarizes the activities of the NCRD.

The NCRD, established under the National Council for Civilian Research and Development Law, 2002, serves as the primary advisory body to the Government of Israel in all matters related to civilian research and development (R&D).

As the strategic think tank of the Ministry of Innovation, Science and Technology, its main role is to examine, analyze, and map out Israel's research and development systems, identifying needs, strengths, and weaknesses. These systems constitute a fundamental pillar of Israel's economy, and serve as a key growth engine for the country's high-tech industry.

The NCRD Law authorizes the National Council for Research and Development to formulate national R&D policy and to submit recommendations to the Government, through the Minister of Innovation, Science and Technology (in 2024, two ministers served in this role: Mr. Ofir Akunis and Mrs. Gila Gamliel), regarding a comprehensive national policy for the development and advancement of scientific research in the State of Israel.

The NCRD fulfills its national objectives through research studies and surveys, the establishment of professional committees, and engagement of expert consultants—all aimed at formulating and recommending national R&D policy to the Government, through the Ministerial Committee for Science and Technology.

Developing a national R&D policy requires long-term planning, based on systematic data collection and analysis carried out by the Central Bureau of Statistics and other professional objective research institutes. These institutes produce comprehensive reports and analysis on an ongoing basis, enabling continuous monitoring and evaluation of changes in the national R&D landscape.

The Council includes 15 members from academia, research, industry, and public policy, and it operates national subcommittees dedicated to R&D topics.

The Council is supported by external advisors across various fields. Some coordinate the work of the national committees, while others are responsible for developing work plans and budgets, conducting surveys and research studies, and maintaining ongoing collaboration with the Ministry of Innovation, Science and Technology, the Knesset Science and Technology Committee, the Ministerial Committee for Science and Technology, and additional bodies such as the OECD, the Central Bureau of Statistics, and others.

In November 2024, Prof. Noga Kronfeld-Schor was appointed Chair of the Council, succeeding Prof. Peretz Lavie, who completed four years of service.

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2. Components of Research and Development (R&D)

2.1 Basic Research

Basic research in Israel is conducted primarily at universities, relying on highly skilled and distinguished academic personnel — researchers, technical staff, and advanced laboratory infrastructure.
Academic teaching staff play a crucial role in training the next generation of scientists.

2.2 Applied Research

Most Israeli universities have established technology transfer companies designed to commercialize research outputs with market potential.
However, the commercialization of university research results — both in Israel and globally — has had limited success, though Israel recorded several notable achievements in this domain.

Overall, the budgetary scale and revenue produced by university-based research companies remain relatively small compared to the national R&D framework.

2.3 Academia–Industry Partnership

The transfer of knowledge and technology from academia to industry constitutes an important economic growth factor in Israel’s industrial development.

Through its various committees, the NCRD continues to analyze this interaction, drawing on data and surveys to develop policy recommendations.

Among its key recommendations:

- Establishment of applied industrial research institutes adjacent to universities.
- Strengthening knowledge transfer mechanisms to bridge the gap between academic discoveries and industrial innovation.

2.4 Academia–Society Relations

The contribution of academia to Israel's economy extends beyond the academia–industry link. Universities also provide essential benefits to the community, including contributions to education, welfare, environmental protection, and social cohesion.
However, these areas are often underfunded and underprioritized within national R&D investment.

2.5 Industrial Research

Applied research carried out by industry constitutes roughly 80% of Israel's total R&D activity, funded directly by industrial enterprises.
The remaining 20% is financed by government, private, or international sources.

Industrial R&D expenditure has grown significantly over the past decade, particularly in software, communication (ICT), and biotechnology, with a strong emphasis on services and development rather than manufacturing.

2.6 Research Infrastructure

In certain scientific domains—particularly natural sciences and life sciences—conducting world-class research requires sophisticated and costly equipment as well as advanced laboratory facilities, often demanding investments of millions of dollars.

Beyond initial establishment costs, maintaining research infrastructure requires ongoing budgets for both academic and technical personnel, as well as for maintenance of equipment and facilities.
Such infrastructure is also essential for recruiting and retaining top-tier researchers in universities and research institutes.

2.7 Government Research Institutes

Government research institutes (GRIs) are intended to address national applied research needs that cannot be met by private or academic institutions.

Such areas include:

- Environment
- Agriculture
- Health
- Economy
- Society

- National security

It is vital for the government to define these national missions, assign responsibilities between academia and government institutes, and ensure adequate budgetary support.

2.8 Government Role in Research Funding

The government's role in funding research varies by type of research:

- The state primarily funds basic research and research infrastructure.
- By contrast, the state's share in industrial R&D financing is minimal, since such research is often commercially viable and can attract external funding (through public offerings, investments, venture capital, angel investors, or bank credit).

Most of the government's research budget for universities is allocated via the Council for Higher Education (CHE), covering the research component of senior faculty salaries.
This funding partially supports the indirect costs of research, while specific projects are financed by the Israel Science Foundation (ISF) and international bilateral foundations (e.g., U.S.–Israel BARD/BIRD foundations and EU grants).

However, applied research for the public good—which lacks commercial potential—currently falls between the cracks, receiving limited to no funding from either basic-research foundations or private sources.

3. NCRD Work Programs

The National Council for Civilian Research and Development (NCRD) operates in an integrative and multi-disciplinary manner to achieve its national objectives. Its work programs and activities includeseveral key areas:

3.1 Core Activities

- Conducting surveys and research studies:
  Collecting national R&D data through professional committees, periodic reports, conferences, and integration of findings.
- Building and analyzing databases:
  Developing and maintaining R&D indicators on science and technology, including:
  - National R&D investment levels
  - R&D expenditure per capita
  - Input–output analysis of R&D activities
  - Patent registrations and scientific publications
  - Technology forecasting
  - Researcher numbers and quality metrics
  - Comparative international analyses, primarily with OECD member nations
- Preparing thematic reports in specific domains:
  The NCRD, through its national committees, produces focused policy papers on:

    - Energy
    - Space research
    - Cybersecurity
    - Academia–Industry relations
    - Life Sciences
    - Research infrastructure
    - International scientific collaboration
    - Environmental R&D
    - Government research institutes
    - Government Chief Scientists
    - Strengthening R&D in the periphery
    - Science education and lifelong learning
    - STEM education and human capital development
- Technological forecasts:
  Assessment of emerging technologies, evolving knowledge fields, and declining research domains, as well as human capital forecasting.
- Setting national investment priorities:
  Establishing priorities for allocating state resources in line with evolving technological and societal needs.

3.2 Content of the 2024 Annual Report

The 2024 NCRD annual report highlights the Council's activities in formulating national research and development policy.
The report includes:

- Structure and operation of the Council
- Analysis of Israel's civilian R&D system, differentiating between government and private sector investments, including a detailed discussion on venture capital (with emphasis on early-stage company funding)
- Focus on education and higher education, analyzing Israel's human capital base—both current and projected—underpinning the future of R&D
- Sectoral analysis focusing on three key industries:
    - Health
    - FoodTec
    - Energy & Environmental Technologies (Cleantech)
- NCRD's response to international academic boycotts
- Review of NCRD committees active during 2024 and their recommendations (not all committees submitted final reports):
    - Science & Education Committee
    - Infrastructure Committee
    - Academia–Industry Committee
    - Environmental R&D Committee

4. Israel's High-Tech Landscape – 2024 Overview

The Israeli high-tech sector continues to serve as a core engine of national economic growth. In 2024, the industry contributed 19.7% of Israel's GDP (≈338.8 billion NIS) and 53% of total exports, driven primarily by software services.

Israel's robust research and development (R&D) infrastructure , the foundation of its thriving high-tech sector , is rooted in an advanced education system and high-quality higher education institutions. However, there are clear signs of a decline in high-quality human capital: a decrease has been recorded in the number of individuals employed in the high-tech sector, alongside a growing trend of employees leaving Israel for periods of one year or longer.

Since the outbreak of the Swords of Iron War, private high-tech companies have been employing approximately half of their R&D personnel outside of Israel. Moreover, the most recent data presented in this report indicates a decline in science studies in high schools.

4.1 National Civilian R&D Expenditure

In 2023, national civilian R&D expenditure totaled 92.7 billion NIS (2015 prices), equal to 6.3% of GDP —
a 1.4% decrease compared with 2022.
Nevertheless, Israel remains the OECD leader in both: R&D expenditure as a percentage of GDP, and per capita R&D spending.

- ***Figure 1: National expenditure on civilian R&D in Israel, 1996–2024 (billion NIS, 2020 prices).***

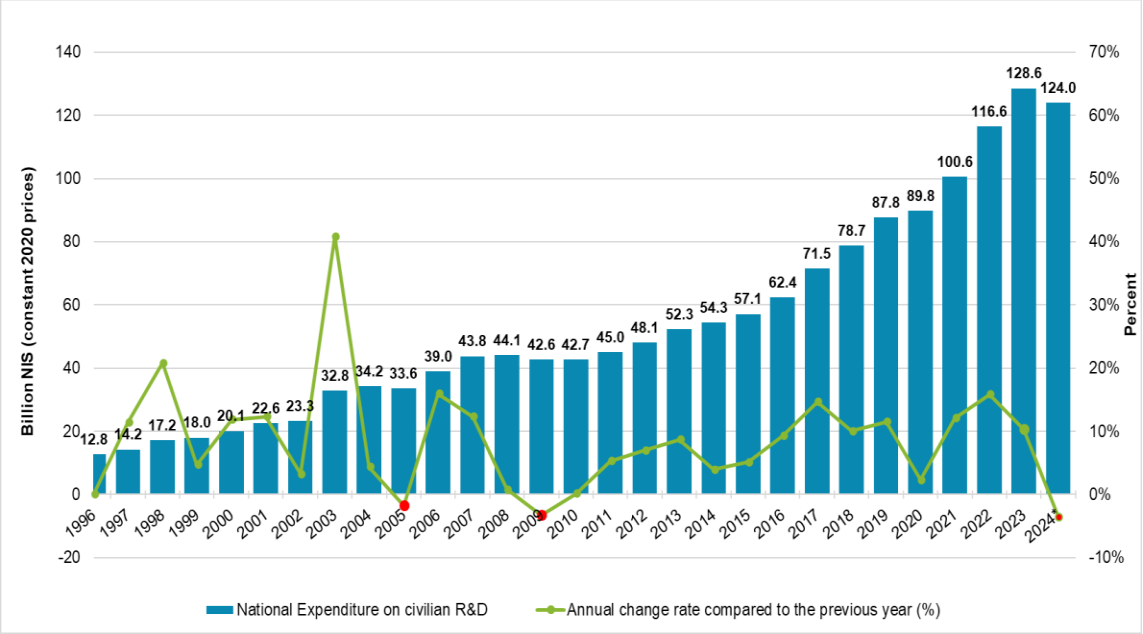
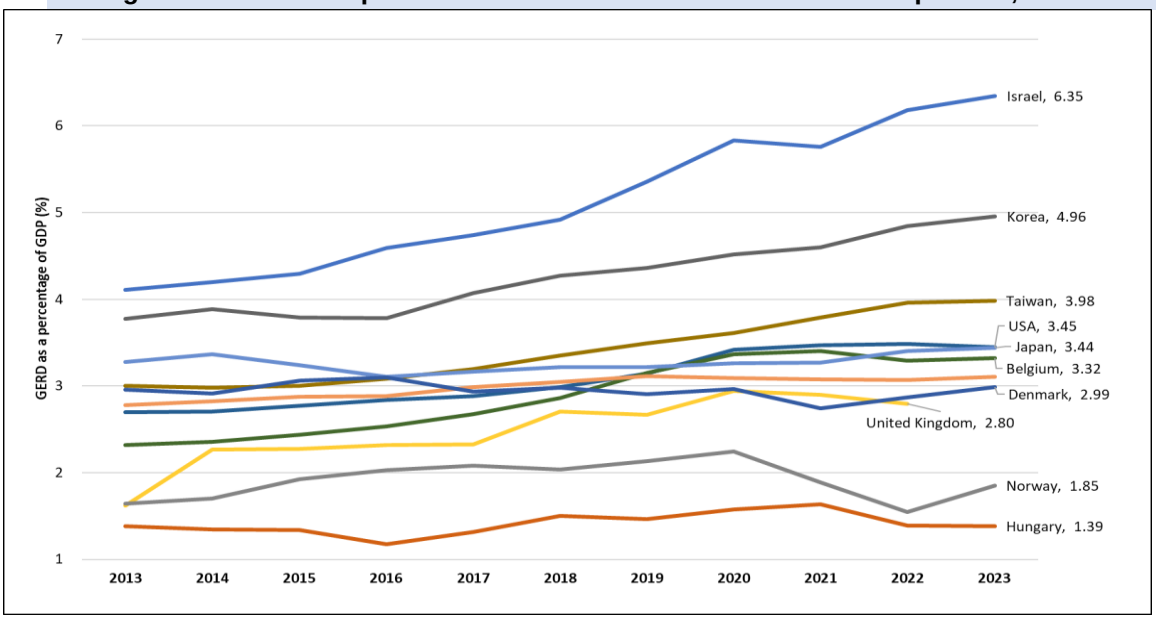


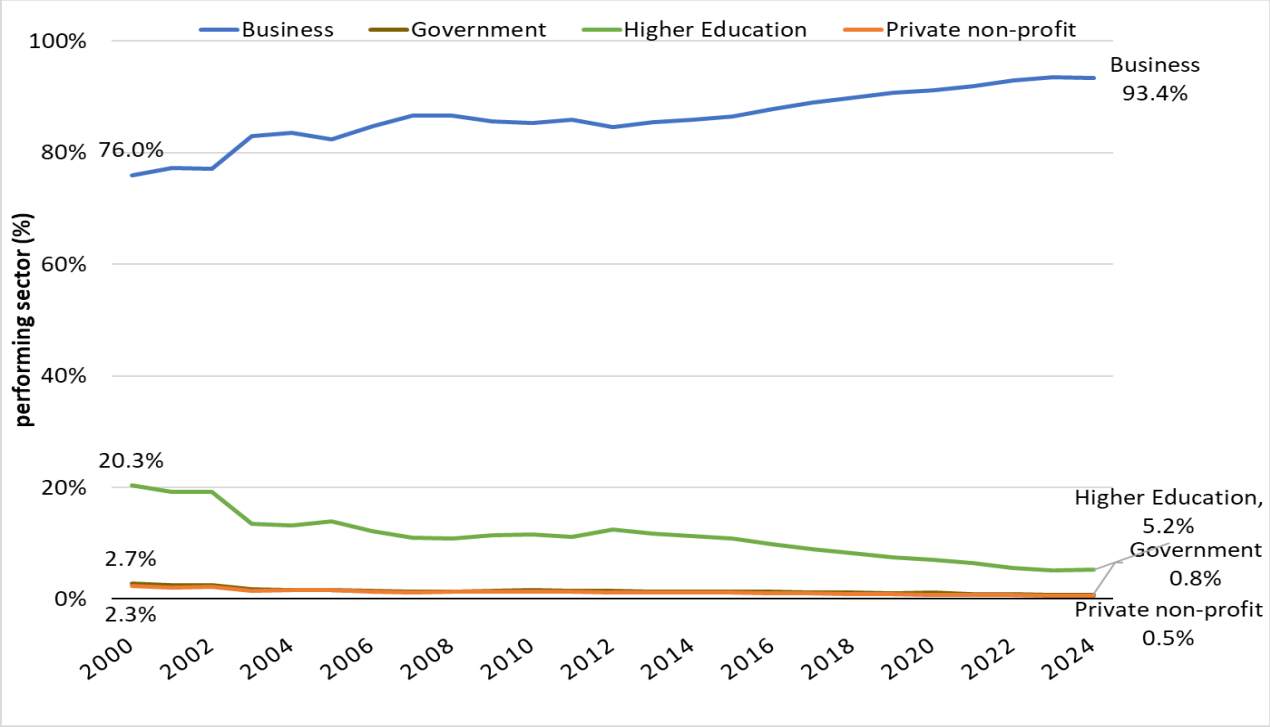
Figure 2: National expenditure on civilian R&D international comparison, 2023



- A sectoral analysis of R&D funding and performance shows that foreign funding to the business sector accounts for approximately half of all R&D conducted in Israel (NIS 48.1 billion out of NIS 100.7 billion), indicating a significant presence of foreign companies' R&D centers. The business sector itself finances a similar volume (NIS 50.6 billion).
- Overall, the share of total R&D funding in Israel originating from foreign sources (49.4%) is considered the highest among OECD countries, while the share of government funding is particularly low, standing at only 6%, including funding for R&D in higher education.

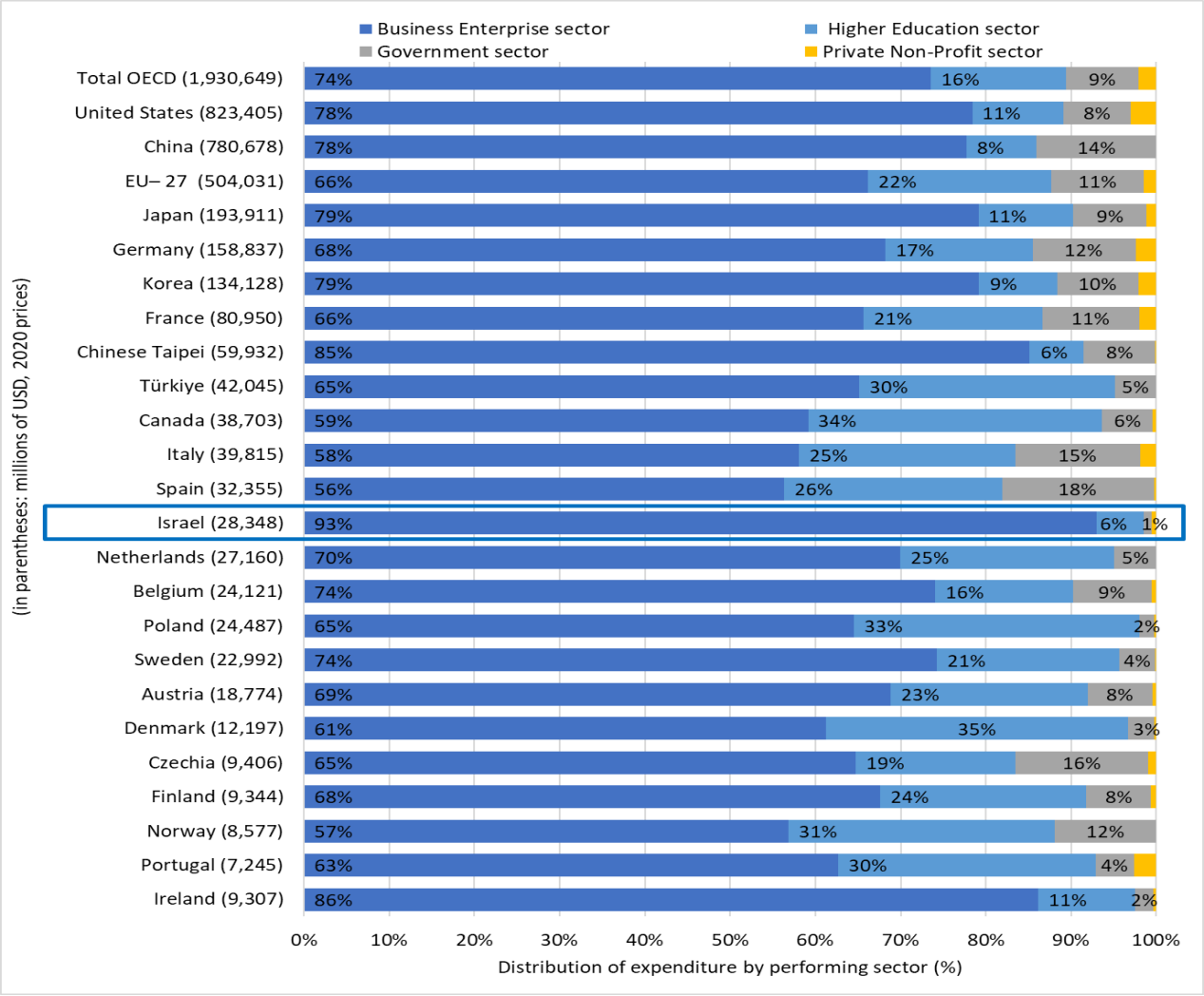
- Within the higher education sector, the government is the primary funder (76%), while 14% of R&D is financed by foreign sources. The linkage between academia and industry remains relatively weak.
- The share of government funding is 6%, one of the lowest among OECD countries. Within higher education, however, the government is the dominant funder (76%), while 14% originates from foreign sources.
  Academia–industry collaboration remains relatively weak.

Figure3: Distribution of national expenditure on civilian R&D in Israel, by performing sector, 2000–2024.



The proportion of R&D performed by the business sector increased dramatically — from 58.7% in 1996 to over 90% in 2023.
Meanwhile, research in the academic and government sectors declined substantially.
Compared to the OECD, Israel stands out with 92% of R&D conducted by business, versus the OECD average of 74%.
The higher-education sector accounts for only 6% of total R&D activity and the government sector for 1%.

Figure 4: Distribution of national civilian R&D expenditure in Israel by performing sector: international comparison, 2023.



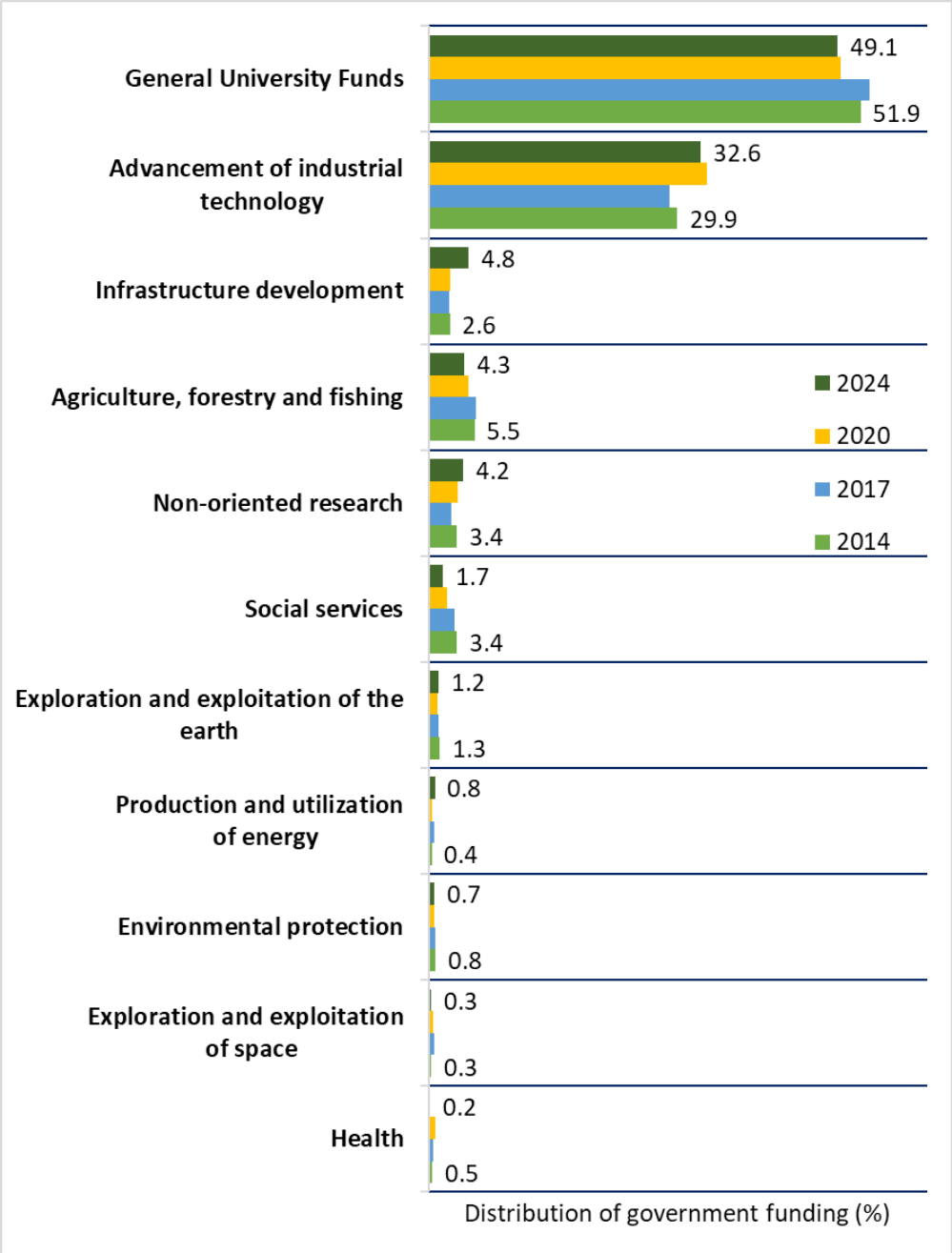
4.2 Government R&D Funding (2023)

Government funding for civilian R&D in 2023 totaled 10 billion NIS — less than 1% of total national R&D spending.
Of this:

- Around half was directed to university research funds (Council for Higher Education – VATAT).
- Approximately one-third supported industrial technology development.

Government support remains focused on academia and industry, yet relatively low in health, environment, and social services.

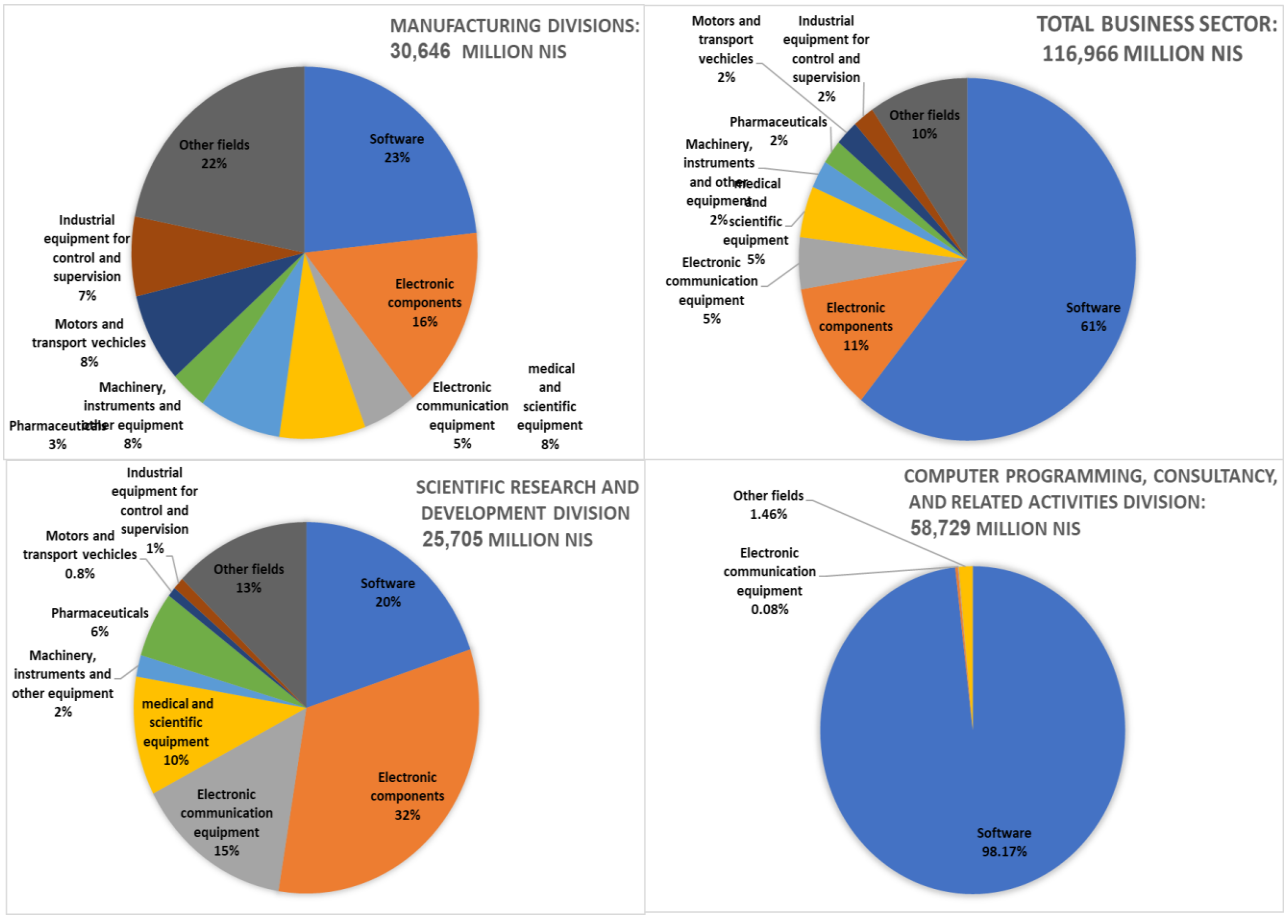
Figure 5: Financing of civilian R&D by government ministries, by objective, selected years.



Approximately half of high-tech R&D expenditure occurs in the software and consulting industries. In 2023, exports of R&D and computing services reached 83.3 billion USD, representing 86% of total services exports.

Israel exhibits a uniquely high share (≈74%) of service-sector R&D, far exceeding most OECD countries.
Within the business sector, software development alone accounts for 60% of internal R&D expenditure.

Figure 6: Current R&D internal expenditure, by type of activity and industrial activity, 2023.



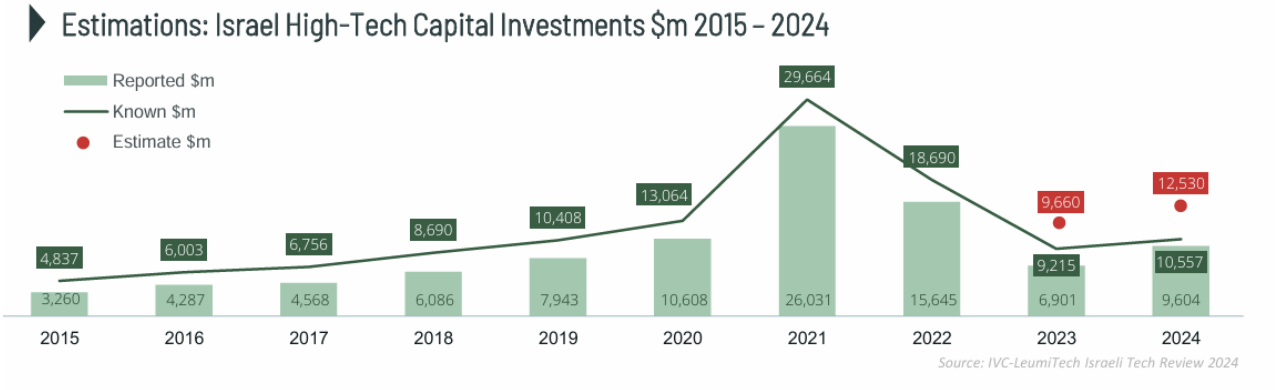
4.3 Human Resources in R&D

The share of R&D employees in Israel is exceptionally high. an overall increase in high-tech employment, the sector's share of total national employment remains stable at around 10% (2023), with early indications of decline in 2024 (data still under review).

4.4 Israel's high-tech

In 2024, Israel's high-tech sector raised $12.53 billion in venture capital across 453 deals, marking a significant improvement over 2023.
However, the number of new startups continued to decline, suggesting ongoing challenges in early-stage innovation.

Figure 7: Estimations: Israel high-tech capital investments $m 2015-2024



5. Education and Higher Education Sector in Israel

- In 2022, total R&D expenditure in the higher education sector amounted to 1.49 billion USD, representing 0.4% of GDP.
  Although this ratio remains fairly stable, it reflects a gradual downward trend over the past decade.
- A significant decline was recorded in the performance of Israeli eighth-grade students in mathematics and science, according to the 2023 TIMSS examination.
  Israel ranked in the lower quartile among participating countries — a result that raised broad concern regarding the future scientific literacy and human capital in the nation.
- In the academic year 2023/24, more than 340,000 students were enrolled across 57 higher education institutions in Israel.
  Among first-year students in 2022/23, approximately one-third chose to study science and engineering disciplines — a stable yet non-increasing ratio compared to previous years.
- The number of faculty positions in universities and public colleges has slightly increased in recent years, mainly within state-funded colleges.

However, the proportion of senior academic staff has remained largely unchanged, despite the overall population growth.

- The number of Ph.D. graduates has remained relatively constant over the past decade, while enrollment in master's programs is declining.
  This downward trend may have longer-term implications for research capacity, as M.A. studies typically serve as the gateway to doctoral training.
- The number of patents granted to Israeli institutions showed mixed trends, with a decline noted in 2022.
- Regarding scientific publications, while Israel's share within OECD publications has remained relatively stable between 2000 and 2023, its international ranking has declined. Likewise, Israel's share of Middle Eastern scientific output has dropped sharply. It is estimated that over 80% of Israel's total scientific publications originate from academic institutions.
- Israel actively participated in the European Union's Horizon 2020 Framework Program for Research and Innovation, achieving significant success in securing international grants. Israeli researchers excelled particularly in natural sciences, life sciences, health, and engineering.
- Israel ranked 24th among participating countries in number of scientific publications and was among the leading nations in ERC (European Research Council) advanced research grants.
- Collaboration through Horizon 2020 significantly enhanced international partnerships and research visibility.
- The leading Israeli institutions in research output under Horizon 2020 were:
  - Tel Aviv University
  - Weizmann Institute of Science
  - Technion – Israel Institute of Technology
- Israeli researchers published extensively in Physics, Astronomy, and Computer Science.
- The ERC grants had a major positive effect on the number of highly cited papers by Israeli scientists.

The report warns that any threats to Israel's participation in future EU framework programs could have serious negative implications for the country's research and technological capacity.

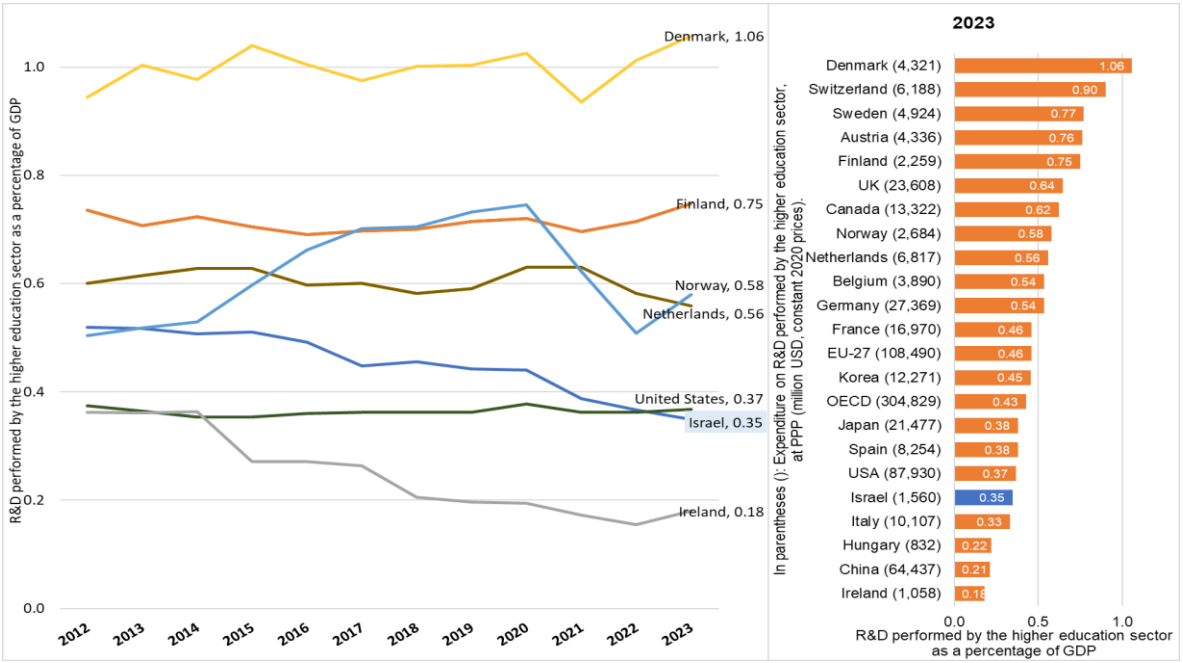
5.1 Comparative Data: Educational Attainment in Israel vs. OECD

- The proportion of adults with tertiary education in Israel (39%) is higher than the OECD average (35%), but lower than in Ireland and other leading innovation economies competing with Israel for global investment.
- Israel leads in the share of first-degree (B.A./B.Sc.) holders, yet lags significantly in advanced degrees, particularly master's programs.
  → This underscores the need to encourage graduate studies as a strategic investment in R&D talent.
- Israel compares favorably in Ph.D. enrollment in STEM disciplines, but the decline in Master's-level STEM studies could undermine the future pipeline of doctorates and high-skilled researchers.

5.2 Key Insights and Conclusions

- Israel's business R&D sector remains heavily dependent on foreign investment.
- Education and higher education indicators show signs of erosion, particularly in TIMSS scores and academic research investment.
- Budget cuts in higher education will likely affect the high-tech sector in the medium to long term.
- Between 2013 and 2021, revenues from intellectual property commercialization by university tech-transfer companies declined by 75%.
- There is an urgent need to reinforce academia–industry partnerships in Israel.
- Startup activity decreased by 16% between 2019 and 2023, with fewer new companies being founded and increasing closure rates.
  This is part of a decade-long downward trend in the establishment of new startups.

Figure 8: R&D performed by the higher education sector as a percentage of GDP, international comparison, 2012–2023.



6. Analysis of Three Selected R&D Sectors

The 2024 report provides detailed analysis of three priority research and development sectors in Israel:

1. Life Sciences and Health
2. Agrifood Tech (Agriculture and Food Technologies)
3. Energy and Climate Tech

6.1 Overview and Key Findings

- Since 2021, all three sectors have experienced a slowdown in the establishment of new companies.
- Increasing government investment could stimulate renewed growth, particularly in Agrifood Tech and Energy & Climate Tech.
- The events of October 7th, 2023 underscored the strategic need for national resilience and the importance of regional and international scientific cooperation.
- The health sector continues to attract strong levels of foreign investment.
- Israel holds the potential to become a global leader in Agrifood Tech and Climate Tech, yet the 2023 war disrupted several of Israel's competitive advantages.
  Reclaiming this leadership requires renewed investment in infrastructure and R&D, along with addressing structural barriers to innovation and growth.

7. NCRD Committees – Activities and Recommendations

In 2024, the NCRD operated four national committees:

1. Science Education Committee
2. Academia–Industry Relations Committee
3. National Infrastructure & Defense Facilities Committee
4. Environmental R&D Committee

At the end of 2024, the NCRD established two new committees that began work in 2025:

- Emerging Technologies for the Upcoming Decade Committee,
  in collaboration with the "Horizon Line" Division of the Ministry of Innovation, Science and Technology.
- Public R&D Funding Review Committee.

Moreover, under the Academia–Industry Relations Committee, a special working group was created to evaluate the budget model of the Council for Higher Education (VATAT) and its effect on academia–industry collaboration.

Similarly, the Infrastructure Committee adjusted its focus to assess the impact of CHE-VATAT funding models on the operational behavior of universities and research institutions.

7.1 Science Education Committee

Chair: Dr. Ariel Heiman

Working Groups and Topics

Working Group Topic	Head of Working Group
1. Integration between formal and informal education – emphasizing pedagogy, knowledge, and skills	Prof. Ami Moyal
2. Improvement of teaching quality and teacher development	Dr. Liat Ben-David
3. The economics of science education and its contribution to Israel's national and economic resilience	Prof. Haim Teitelbaum
4. Science education in elementary schools (short- and long-term perspectives)	Prof. Tali Tal

Committee Objectives

- To analyze and recommend a broad national strategy for science and technology education, both formal and informal, across all age groups.
- To identify key measures and domains required to strengthen Israel's science and technology education system.
- To evaluate priorities in science–technology education in light of global and domestic trends.
- To examine the readiness of Israel's education system for future technological and scientific challenges.
- To assess and recommend human and physical infrastructure for science education, including both students and teachers, and the essential skills needed to meet Israel's future R&D needs.

7.2 Academia–Industry Relations Committee

Working Groups and Leaders

Working Group Topic	Head of Working Group
1. Academic knowledge transfer for public benefit	Prof. Dan Feld
2. Human capital development for industrial and economic needs	Prof. Arnon Bentur
3. Chief Scientists' activities within government ministries	Prof. Avi Domb

Committee Mandate and Focus

The committee studies the scope and quality of collaboration between academia and the economy,
with the aim of strengthening non-commercial (public) R&D foundations vital to Israel's national and social resilience and to sustainable growth.

It emphasizes the development of policy mechanisms for knowledge transfer and collaboration between academia and key public sectorsparticularly in education, health, environment, and societal infrastructure.

Main Areas of Activity

1. Academic Knowledge Transfer for Public Welfare

- Creation of evidence-based national policy on academia–industry partnership.
- Developing intellectual property policies and partnership models focusing on national benefit rather than purely commercial value.

2. Development of Academic Human Capital

- Formulating a national strategy for lifelong learning (LLL).
- Establishing a national framework for internships and industrial training within academic programs.

3. Chief Scientists in Government Ministries

- Establishing support and advisory frameworks between academia and government, enabling long-term, data-driven policy formation — particularly valuable during times of crisis.
- Assessing how chief scientists can provide a strategic anchor within ministries, balancing long-term foresight and short-term operational needs.

7.3 National Infrastructure and Defense Facilities Committee

Chair: Prof. Yeshayahu (Ishi) Talmon

Overview

Civilian R&D in Israel is conducted by a broad range of organizations:

- Universities (primarily basic research)
- Government research institutes (nationally mandated applied research)
- Hospitals (perform independent medical research)
- Industrial R&D ventures (often with public support through the Innovation Authority)
- R&D centers of multinational corporations operating in Israel

Infrastructure is essential for both individual and institutional research — academic, governmental, or industrial.
Over time, the cost of establishing and maintaining research facilities has risen sharply, often exceeding the capacity of a single researcher, institution, or company.

In Israel, responsibility for funding such infrastructure is shared among multiple bodies:

- Universities, through VATAT (Council for Higher Education)
- Industrial R&D, via the Israel Innovation Authority
- Government R&D (agriculture, health, environment, etc.), through respective ministries

The TELAM Forum (National Research Infrastructures Forum) coordinates pooled funding mechanisms to optimize national resources and avoid duplication.
The committee examines these frameworks and develops recommendations for strategic investment in new national R&D facilities.

7.4 Environmental R&D Committee

Chair: Prof. Tamar Dayan

Scope

The committee examines environmental research and policy implications in the era of global change, including climate, biodiversity, and sustainability challenges.

Main Objectives

- Assess the environmental impacts of government and private sector development initiatives.
- Evaluate Israel's R&D investment in environmental fields, including both quantity and quality of scientific output.
- Identify gaps in expertise and propose strategies for capacity building in environmental research and industrial applications.
- Provide institutional recommendations to strengthen the environmental R&D ecosystem within Israel.

NCRD Advisors

- Dr. Gury Zilkha
- Dov Russo
- Debby Kaufman
- Dr. Neil Namir
- Ran Benjamin

NCRD Coordinator: Racheli Rahamim