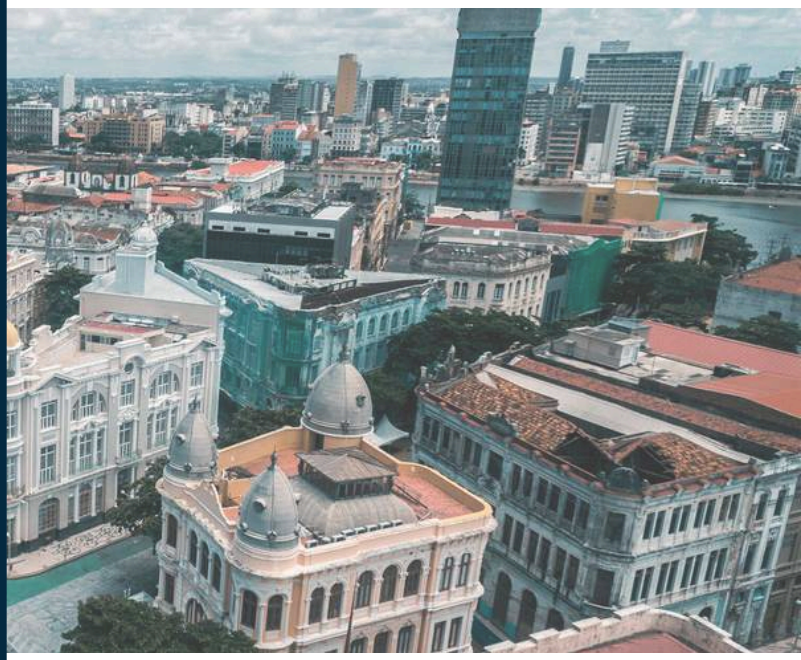
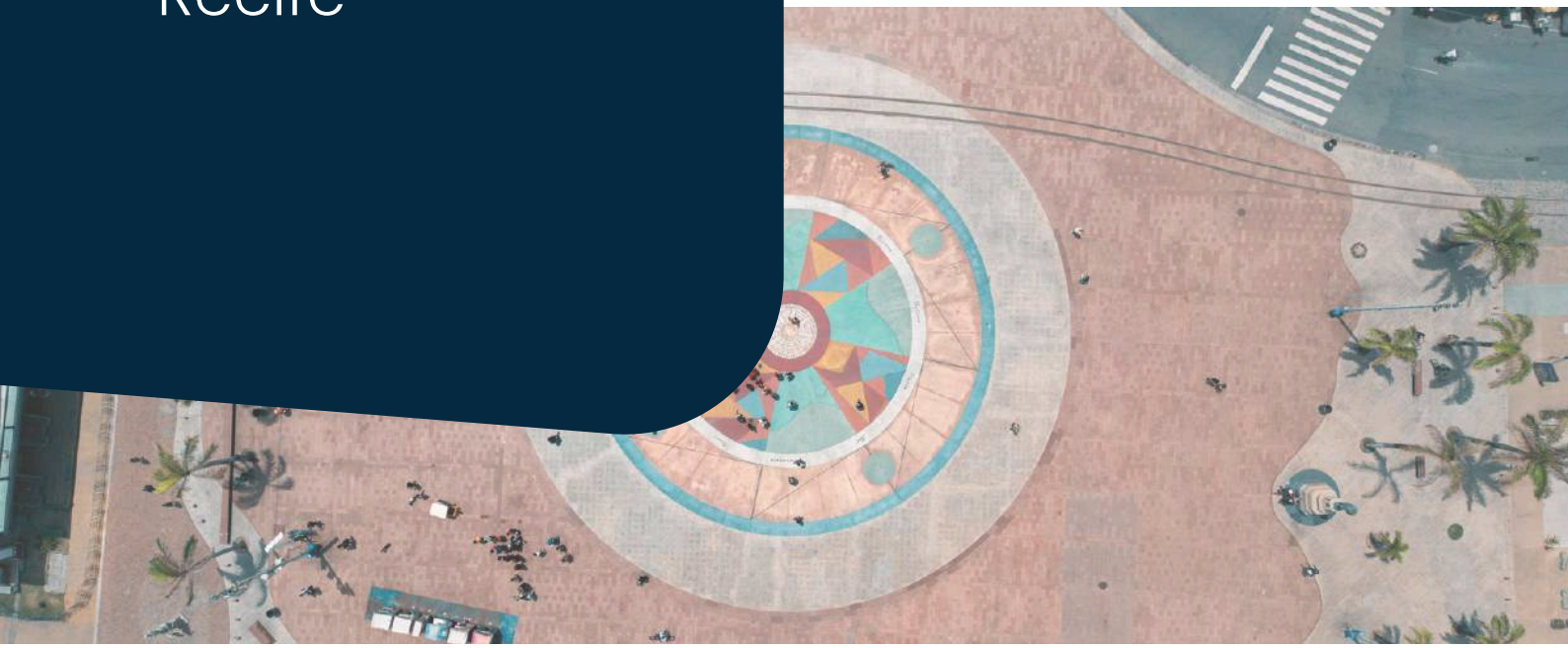
Innovation Ecosystems in Brazil

Recife





Innovation Diplomacy Program

MINISTÉRIO DAS RELAÇÕES EXTERIORES ERENE RECIFE

MINISTRY OF FOREIGN AFFAIRS

BRAZILIAN GOVERNMENT BRASIL UNITING AND REBUILDING

Latest update: 29/08/2024

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ANNEX I - Embrapii

Foreword

Brazil is a country well-known for its beautiful beaches, artistic soccer, and multicultural carnival. Even though all these images are essentially true, there is a lot more to it than initially meets the eye.

With this ***Innovation Ecosystems in Brazil*** series, we aim to show a new and exciting side of our country. We seek to show how different parts of Brazil build their future through science, technology, and innovation. It is also our goal to facilitate connections between Brazilian and foreign innovative actors, in order to support international collaboration, businesses, and exchanges.

For this first edition, we selected Recife, one of the oldest and most culturally rich cities in Brazil, full of history and challenges. During the early 1990´s, the city faced economic stagnation and the social impacts deriving from it. The proposed solution for those challenges was to develop a bold initiative that brings innovation, social inclusion and regeneration of the city's historic center.

After thirty years, Recife is a case of an ongoing process that proves how technology and innovation are fundamental tools for inclusive development. With the involvement of a large group of actors from government, the private sector, academia, and society as a whole, Recife's innovation ecosystem has become a role model in Brazil that deserves a closer look from outside.

Ambassador Lineu Pupo De Paula
Head of the Regional Office for the Northeastern Region

General information

Recife

Recife is the capital of Pernambuco state, located in the Northwest of Brazil. The city has around 1.48 million inhabitants, the ninth largest population in Brazil and the third in the Northwest, behind Fortaleza and Salvador.

The **Metropolitan Region of Recife** (RMR, in the portuguese acronym), an urban conglomerate that includes other 13 neighboring cities, is the fifth largest in Brazil, with around 3.78 million inhabitants.

Where is Recife ?

Economy

Recife has the highest GDP *per capita* in the Brazilian Northwest (circa USD 6.500) , and the third highest nominal GDP in the region (circa USD 10 billion), after Fortaleza and Salvador. The service sector is responsible for 69% of GDP, followed by the public sector (17%) and industry (13%).

In 2023 the most relevant economic groups, by revenue, were health (23.5%), civil construction (12.3%), information technology (11.2%), and education (7.6%).

On international trade, between January and October 2023, there were USD 87.9 million in exports from Recife, with main destinations Peru (34%), Portugal (15%), and United States (12%).

Between 2016 and 2020, medium and high-technology exports represented 42.3% of Pernambuco state's gross exports, the third largest proportion in Brazil. In the Northwest region, Pernambuco is responsible for 18% of such exports, behind Bahia and Maranhão. This comes as a result of the automotive and the petrochemical industries in Pernambuco, as well as the development of Porto Digital and Parctel technology parks.

General information

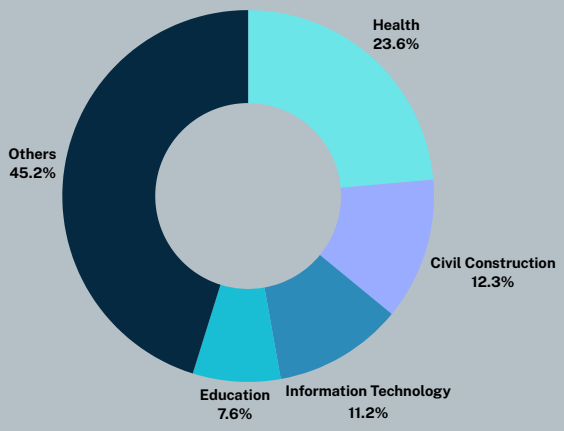
1.488.920
inhabitants

218 km²

USD 10 billion

USD 6.000
(per capita)

Main economic groups



Education

Recife currently has 46 higher education institutions, amongst them the Federal University of Pernambuco, ranked as one of the top 10 Brazilian universities and housing one of best graduation courses in Computer Science in the country.

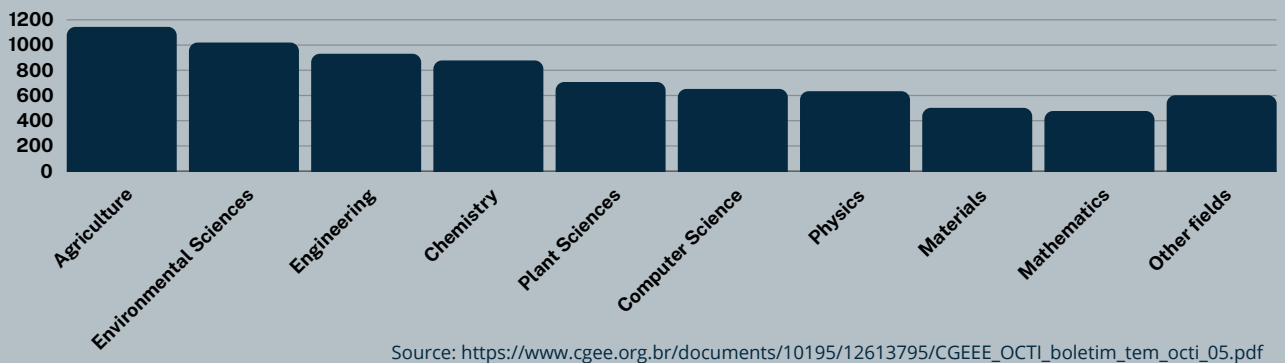
In 2020, Pernambuco state's population had 25,7 masters and 7,6 doctors per 100.000 inhabitants, above the Northeast's average (21 and 5,5), yet below the national average (28 and 8,6).

Research

Between 2017 and 2021, researchers from Pernambuco authored and published a total of 13.663 papers. The main areas were agriculture, environmental sciences, engineering, and chemistry, with the following topics having received more attention:

- **Agriculture**: agriculture and food systems for humans and animals; irrigation and water deficiencies; soil quality.
- **Environmental sciences:** *caatinga* biome and its biodiversity, water vulnerability and pollution; climate change.
- **Engineering:** cloud computing and IoT applications; microstructures, new materials and design; neural networks, predictive models, and energy aplications; electrodeposition and corrosion.
- **Chemistry:** biologic control; bioluminescence, polymers and nanostructures; pharmaceutical sector

Main areas of research



Source: https://www.cgee.org.br/documents/10195/12613795/CGEEE_OCTI_boletim_tem_octi_05.pdf

In 2021, 30,5% of the research conducted included the participation of international partners. Of those, 65% are on a bilateral basis. The most frequent partners, in decreasing order, are United States, Portugal, France, United Kingdom, Germany, Spain, Canada, Italy, Chile, and Mexico.

Regulatory sandbox

Recife established a regulatory sandbox in an initiative called 'E.I.T.A! Labs'. With this tool, the city transformed its entire urban space into a testing environment for innovations.

E.I.T.A! Labs consists of an initiative to relax norms and adapt regulations to engage the technology and innovation ecosystem to experiment with private products and services directly with citizens.

With continued public calls and selection rounds for the E.I.T.A! Labs, the possibility of testing in a controlled environment, business validation and gains in scale for selling solutions to Recife and other public institutions are guaranteed.

Points of contact

State Government of Pernambuco

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City Hall of Recife

Evisson Fernandes de Lucena
General Manager for Science, Technology, and Innovation Policies
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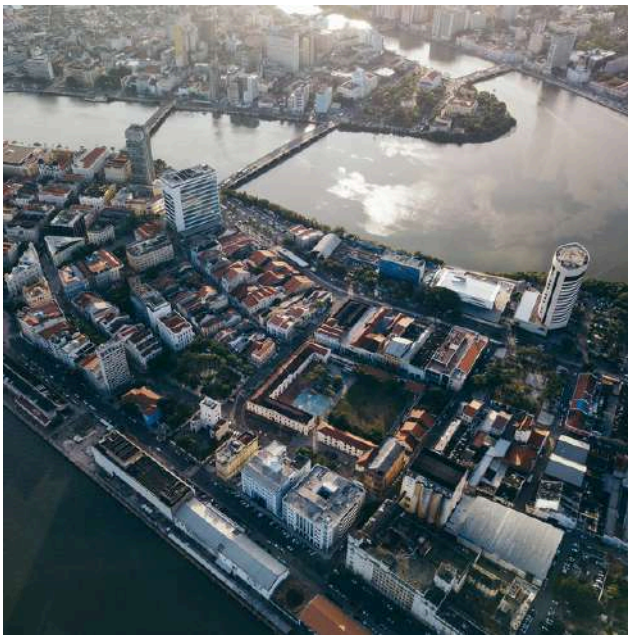
Technology Parks

Porto Digital

Porto Digital is an innovation district established in the historic center of Recife in 2000 as a coordinated initiative from government, academia and the business sector. It is considered one of the main technological parks in Brazil and a successful case of public policy for innovation. The State Government of Pernambuco provided the initial funding of around USD 6.8 million to install infrastructure and establish a non-profit organization to manage the district: The Management Nucleus for Porto Digital (NGPD).



Credits: Envato Elements

Far more than a innovation policy, Porto Digital is also a social, urbanistic, and cultural policy to revitalize Recife's historic center. Companies and organizations established in Porto Digital benefit from a service tax reduction from 5 percent to 2 percent and property tax exemptions. There are also subsidized credit lines from the Brazilian National Development Bank (BNDES) to restore historical buildings.

Porto Digital in numbers

+ 400 companies

+ 18 000 people employed

+ USD 1 billion in businesses

+ 138 000 m² of historical buildings restored

Main economic sectors

Software

Information & Communication Technologies

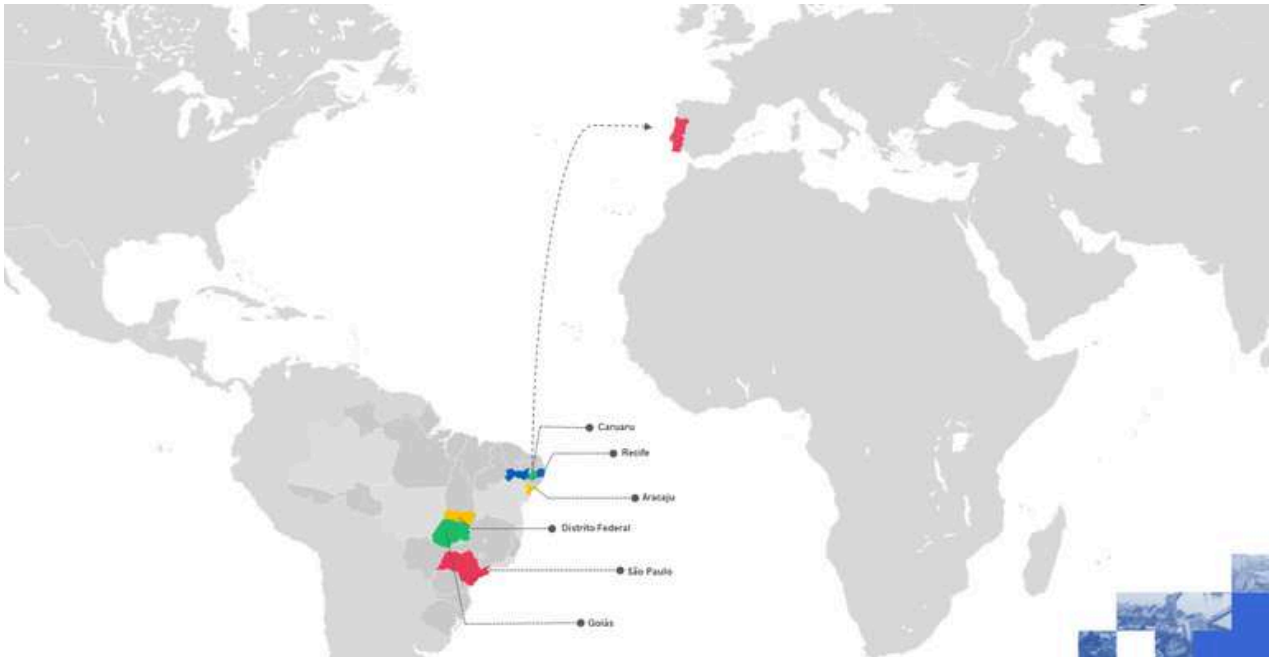
Creative Economy

From its creation, Porto Digital has had strong presence in software development, reaping the benefits from the talents trained at the Federal University's Center of Informatics. Currently, virtually all Brazilian smartphones have technologies produced by companies established in Porto Digital and the ecosystem has high profile costumers such as Apple, Motorola, Samsung, Warner Bros, and the Olympic Committee, among others.

Porto Digital also provides support to the creative economy sector through its project 'Portomídia', which focuses in six economic subsectors: Games, video animation, multimedia, design, photography, and music.

Porto Digital Hubs

As Porto Digital seeks to expand and create connections of its ecosystem within Brazil and abroad, it has established six hubs outside Recife.



Source: Porto Digital´s institutional presentation

The hubs provide connection with other regions in Brazil and with the Portuguese ecosystem, in Aveiro, Portugal, through its European hub: “Porto Digital Europe”. This project offers coworking spaces and acceleration/softlanding services to companies seeking to expand their businesses to Europe.

Companies and businesses

As of 2024, there are 415 companies established in Porto Digital, with around USD 1 billion in asset value and 18 386 people employed. Thanks in large part to Porto Digital’s ecosystem, technology services have become the third largest service sector in Recife/PE, behind health and civil construction.

The economic incentives from the aforementioned service tax reduction and property tax exemption, as well as the positive externalities arising from being located in an innovation district, has provided fruitful territory to the development of local technology companies and have attracted large companies and businesses to establish their own offices.

Top 10 revenue-generating companies

The technology consulting company established, in 2017, its Innovation Center in Porto Digital. The Center is the largest innovation space of the company in Latin America.

In 2012, Avanade arrived in Porto Digital with its local office focused software and solutions development.

Founded in 2008 in the Porto Digital ecosystem, Avantia is a security and monitoring technology company. In 2013, the company launched its R&D division in Recife, Avantia Labs.

CESAR is a non-profit R&D center founded within Porto Digital, focused mainly in software development.

The multinational consulting firm has been present in Recife since 1917. In 2023, Deloitte opened its second Brazilian Innovation Center, the first in the Northeast region, in Porto Digital.

EDS is a company focused in integrating digital technologies to create solutions for client services, data intelligence, and cloud computing. The company's headquarters are located in Porto Digital.

The largest TV network in Brazil, Globo, has its local headquarters established in Porto Digital's ecosystem and is a strong partner in projects such as Embarque Digital, a technology training initiative, and Rec'n'Play, a large technology and cultural festival held in Recife.

The American software company arrived in Recife in 2018. In 2024, Liferay moved to one of the historical buildings in Porto Digital, the Old Customs, to expand its activities in Recife and be closer to the innovation ecosystem.

Neurotech is a software company focused in data, sales, credit and fraud analysis. The company was created in 2002 inside the Federal University of Pernambuco, in Recife, and soon later established itself in Porto Digital´s ecosystem. In 2023, the Brazilian stock market B3 acquired the company.

Tempest is the largest cybersecurity and digital fraud prevention company in Brazil. The company was incubated in CESAR, in 2000, and in 2020 received substantial investments by Embraer, the main Brazilian company in aeronautics.

Startup communities in Porto Digital

MANGUEZAL is a community with more than 60 startups from Recife to support collaborative practices and learning of technology, design and entrepreneurship across startup ecosystem.

Contact: ana@escolahappen.com.br

Porto Digital Startups is the community managed by NGPD. Startups in the community will benefit from Porto Digital's infrastructure and networking.

Contact: daniel.lima@portodigital.org

Coworkings in Porto Digital

Point of contact in Porto Digital

Mariana Pincovsky
Executive Director
Management Nucleus for Porto Digital
mariana.pincovsky@portodigital.org

Parqtel

Created in 1996, Parqtel is a technology park located in Recife focused in electronics, supported by the Pernambuco State Government. In 2016, the technology park went through a repositioning process to transform itself into an innovation habitat that brings together government, industry and academia to promote RD&I and technological services.

Parqtel at a glance

- 10 companies installed
- 17 incubated companies
- Industrial Robotics Lab
- Metalworking Lab
- Electronics Prototyping Lab
- Design and Product Modeling Lab

Main economic sectors

- Automotive industry
- Electronics and semiconductors
- Renewable energies
- Metalworking industry
- Telecommunications and Infomation Technology
- Medical equipments
- Naval industry
- Aeronautics industry

Research and Technology Organizations

Research and Technology Organizations in Recife

Research and Technology Organizations (RTOs) play an important role in building bridges between academia and companies by developing research, development and innovation (RD&I) projects. In Brazil, many of those organizations are either public or publicly funded entities, with links to local Universities.

RTOs are great instruments for international colaboration, as they can develop trully cooperative projects with other foreign RTOs, companies, and Universities.

Embrapii Units

As a proxy to access high-performing RTOs in Recife, we have included organizations registred as *Embrapii Units.* The Brazilian Company for Industrial Research and Innovation (Embrapii) is a funding agency modeled after the German Fraunhofer Institutes. Its main mission is to connect to support the development of new technologies amongst Brazilian companies.

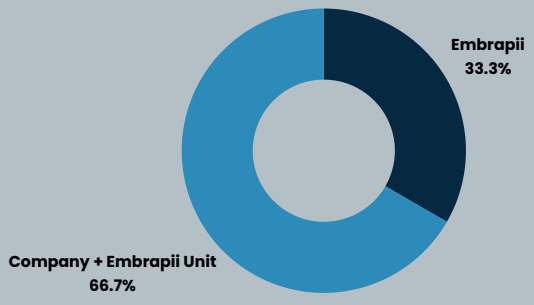
Embrapii Units are RTOs selected by Embrapii to benefit from public non-refundable financial resources. Those RTOs are selected for specific technology sector in which they demonstrate excellence infrastructure

How does (traditional) Embrapii financial support works?

Embrapii provides non-refundable funds

Company provides financial resources

Embrapii Unit provides economic resources
(human capital, research facilities, etc)



and highly-qualified human capital, as well as RD&I know-how with the private sector.

In Brazil, there are currently 96 Embrapii Units - 5 of them are located in Recife: CESAR, CETENE, the Center of Informatics of the Federal University of Pernambuco (CIn/UFPE), the Institute for Oil and Gas of the Federal University of Pernambuco (LITPEG/UFPE), and the Senai Institute of Innovation for Information and Communications Technology (ISI-TICs).

To better understand how can Embrapii Works, and how is it possible to establish international cooperation with Embrapii Units, please refer to **Annex I**, further bellow.

Other RTOs

After maping all Embrapii Units in Recife, we moved on to other RTOs using similar criterea: highly-qualified himan capital, excellence infrastructure, and RD&I know-how with the private sector.

The Center for Renewable Energies (CER) was the first beyond-Embrapii-RTO identified.

CESAR

The Center of Advanced Studies and Systems (CESAR) was founded in 1996 as a Research and Development Organization (RTO) and a venture builder. In 2018, the organization launched CESAR School, its educational branch and university. CESAR also has an impressive portfolio of clients such as DELL, EPSON, Ford, Hewlett-Packard Enterprise, Lenovo, LG, Samsung, and Motorola.

Credits: CESAR´s archive

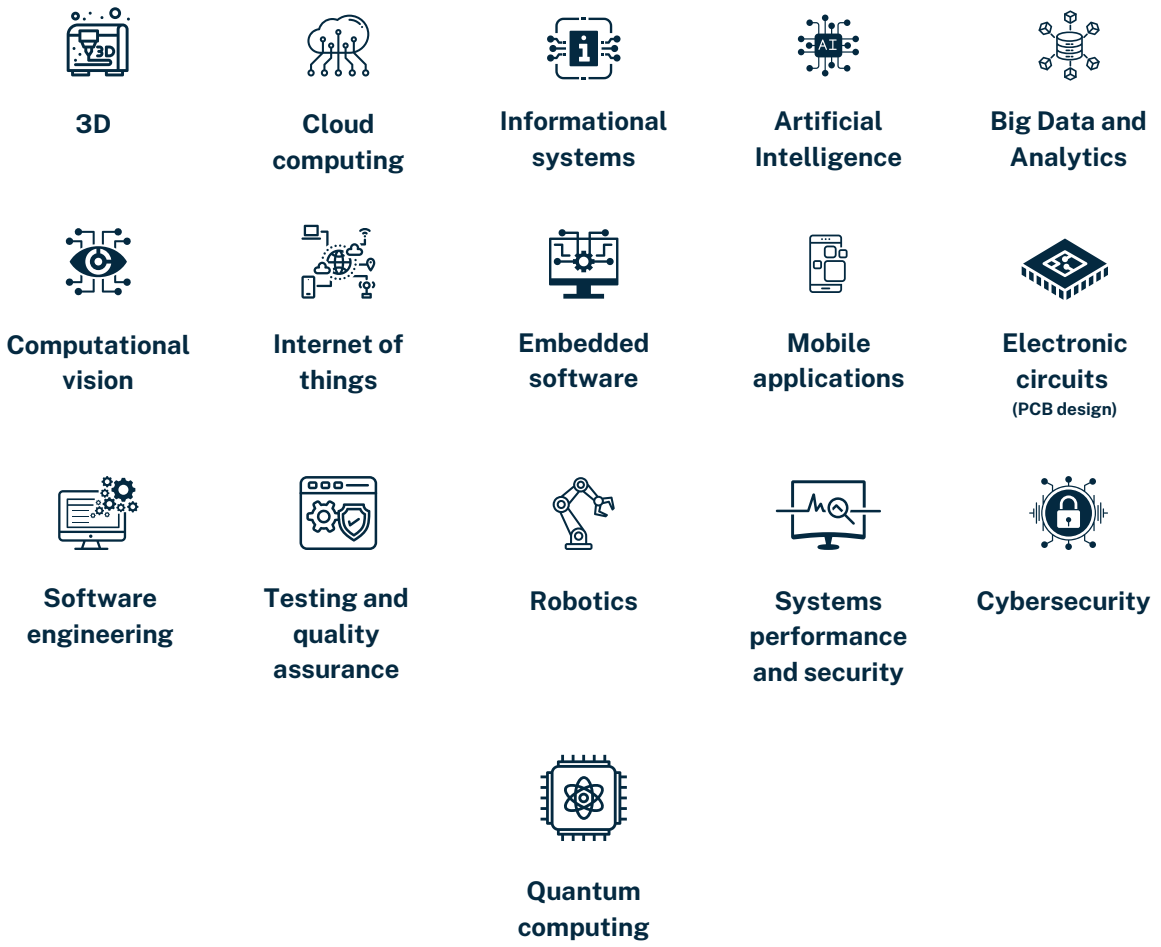
CESAR in numbers

135 RD&I Projects/year

USD 60 million in projects

80 active clients

Technological competences



CESAR is one of the main actors inside Porto Digital's innovation ecosystem. The Research Center contibutes actively to Porto Digital as a venture builder, as many startups developed locally were either created as spinoffs from CESAR or accelerated by the organization. CESAR also collaborates with the State Government and Porto Digital, to provide training in coding, design and entrepreneurship to local populations and to develop a local specialized workforce.

In may 2024, EMBRAPII announced CESAR as its Competence Center for Cybersecurity, which comes along public funding of USD 12 millions to develop technological and research excellence in four areas: identity and access management; privacy and data protection; intelligency for cyber threats; and legal, ethical, and behavioral aspects of cybersecurity.

Blue Sky RD&I Project

The **Blue Sky RD&I project** is a colaborative project between Petrobras and CESAR in the field of high-performance computing (HPC) to explore how new, accelerating superchip platforms could speed up reservoir simulations to optimize the development of blueprints by engineers and reduce its carbon footprint by using less power.

The collaboration has managed to reduce processing time while saving energy thanks to a new industry-leading generation of microprocessors that enable up to twice the performance of today's leading servers on the market.

Lenovo AI for All

In partnertship with Lenovo's **AI for All project**, CESAR helped develop an A.I. solution to translate sign language for hearing people. The project has universal application and was a result of a **five-year R&D project funded by Lenovo** with an investment of USD 4 million.

Artificial Intelligence for Inclusive Beauty

Boticário Group, one of the leading beauty companies in Brazil, partnered with CESAR and local healthtech **Neurobots** to tackle the challenge of distinguishing face skin from lip skin, a crucial aspect for enabling machines and applications to apply lipstick in a precise manner. The goal is to develop a device that would provide autonomy to visually impaired people and to those with upper limb disabilities.

Point of contact in CESAR

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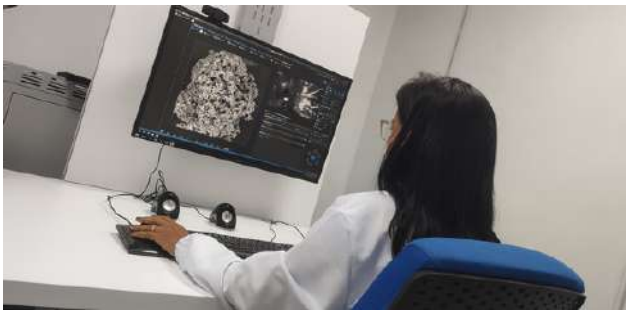
For business partnerships:
E-mail: biz@cesar.org.br

CETENE

The Northwestern Center of Strategic Technologies (CETENE) is a technological research institution linked to the Ministry of Science, Technology, and Innovation of Brazil (MCTI). Created in 2005, CETENE's mission is to support technological and economic development in the Northwestern region, through RD&I projects and open research infrastructure and facilities.

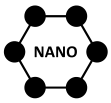


Credits: CETENE´s archive

CETENE is an EMBRAPII Unit in the field of biotechnology applied to micropropagation of vegetable cultures. The Center is also part of the National System of Nanotechnology Laboratories (SisNANO), alongside seven other strategic laboratories in Brazil. SisNANO Laboratories have access to special rounds of funding from the National Fund for Development of Science and Technology.

Research areas

Biotechnology



Nanotechnology

Scientific Computing

CETENE has currently 21 active RD&I projects:

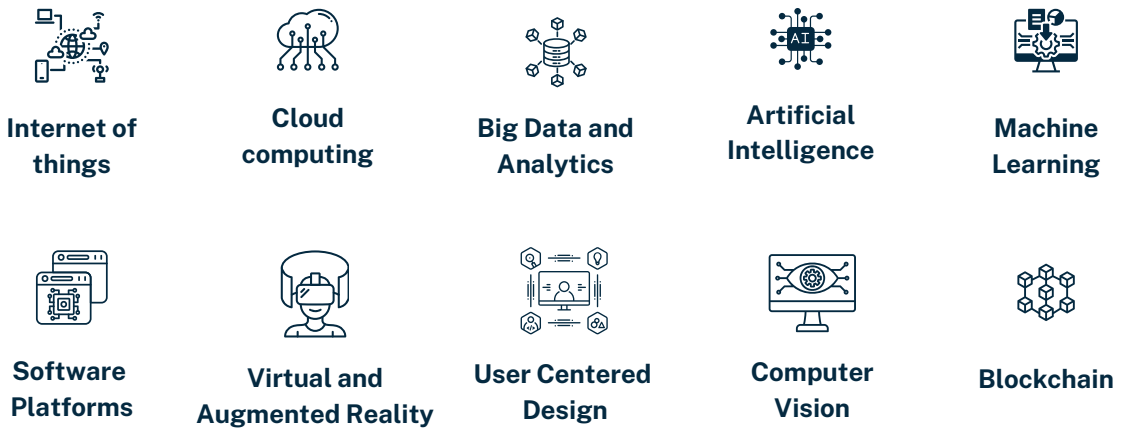
Field	Project
Biotechnology	Development of synthetic routines for products of pharmacological and biotechnological interest: Prospecting for actinobacteria and Trichoderma fungi as growth promoters
Biotechnology	Development of protocols and processes to support large-scale micropropagation of sugar cane and other plant species, with a view to supporting production chains in the Northeast Region.
Biotechnology	Optimization of bacterial production of plastic membrane (PHA)
Scientific Computing	Development of IoT (Internet of Things) platforms with Blockchain applied to agribusiness
Scientific Computing	Development of Artificial Intelligence tools for diverse signal processing and genetic data processing
Nanotechnology	Development of solar cells using new sensitizers adsorbed on nanoparticulate films

Nanotechnology	Development of photochemical systems for clean energy production
Nanotechnology	Evaluation of cell growth on nanotube structures
Nanotechnology	Production and characterization of nanomaterials for agricultural applications
Nanotechnology	Production and characterization of nanomaterials for agricultural applications
Nanotechnology	Production and characterization of nanomaterials for use in solar energy
Nanotechnology	Nanotube matrices for wastewater treatment through photodegradation and mineralization

ISI-TICs

The SENAI Innovation Institute for Information and Communication Technologies (ISI-TICs) was created in 2013 with the aim of fostering the development of innovative software-intensive solutions. ISI-TICs is part of a 27 RTO network, sponsored by the National Service for Industrial Training (SENAI), that carries out research and innovation for all sectors of the Brazilian industry production chain.

Technological competences



The SENAI Innovation Institute for Information and Communication Technologies was accredited as an Embrapii Unit in 2023, to develop projects in the area of Geospatial Intelligence Systems. The RTO will focus on the following areas: satellite positioning and navigation systems; systems for sensing and connectivity; and systems for immersive data exploration.

Digital Twin in Ofshore Oil Plants

In partnership with Shell and PhDSoft, ISI-TICs developed an embedded system and sensor network to monitor the FPSO (Floating Production Storage and Offloading) platform, through a 3D panel, digitizing the inspection and predictive maintenance process to analyze corrosion states.

Ariane

ISI-TICs and the Brazilian startup Pix Force developed Ariane a system to monitor offshore oil leaking, through computer vision and deep learning. The project started in "Shell Startup Challenge", an open innovation project seeking to solve innovative solutions to the oil and gas industry.

i-LITPEG

The Oil and Energy Research Institute (i-LITPEG), founded in 2019 at the Federal University of Pernambuco (UFPE), promotes research and innovation in oil, energy and environmental sustainability. The institute is a result of the colaboration between several research groups of the UFPE and Petrobras, that funded the initial infrastructure.

Credits: Diogo Medeiros

i-LITPEG in numbers

360
researchers

12
Integrated laboratories

+16
Industry colaborators in RD&I

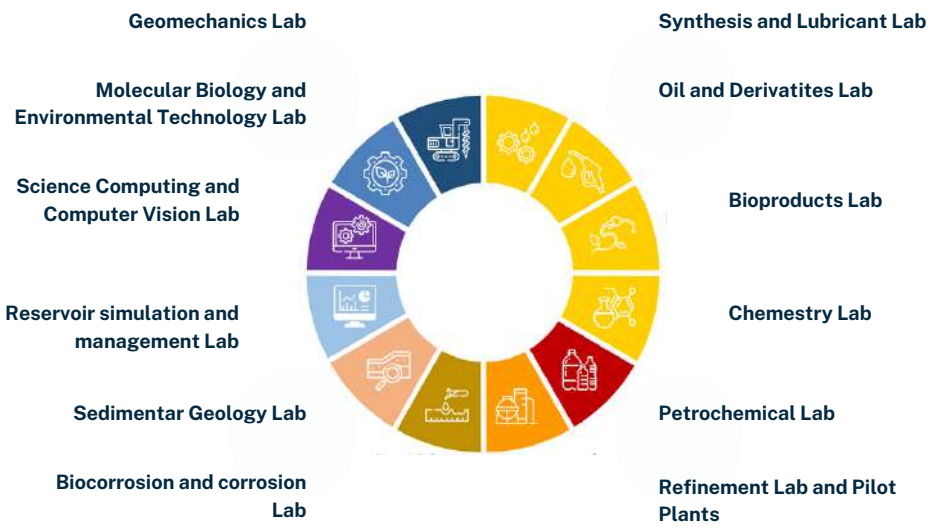
87
Papers published
(2023)

2
Patents published
(2023)

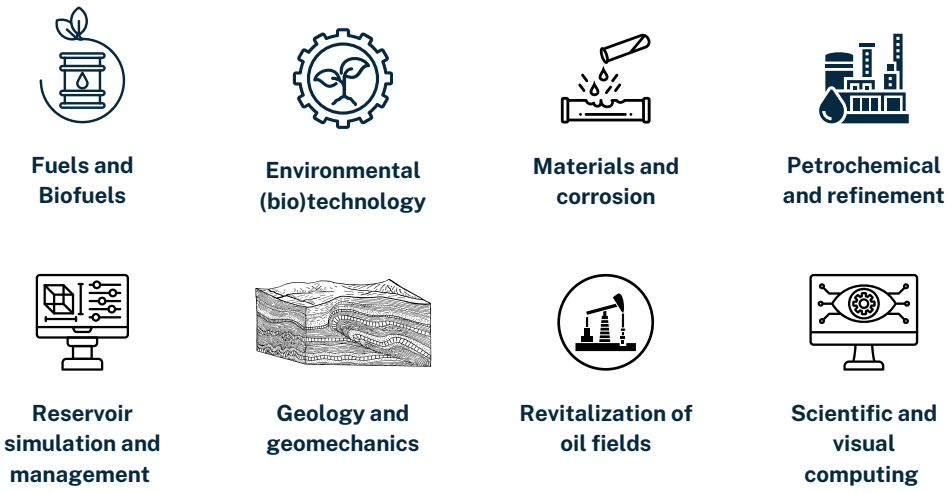
3
Startups incubated

i-LITPEG has 12 integrated laboratories in a 13,299.09 m² complex, with modern infrastructure, including cooling systems, effluent treatment and waste management. The RTO develops sustainable technologies such as carbon capture and bioenergy, collaborating with industry and academia. Since 2023, i-LITPEG is certified as an Embrapii Unit in the field of oil, gas and renewable energy technologies (see our Annex I). It also certified by the National Oil Agency, which allows i-LITPEG to develop RD&I projects with oil companies that face compulsory RD&I spending in Brazil.

Integrated Labs



i-LITPEG's research area



CIn

Founded in 1974, Center of Informatics at the Federal University of Pernambuco (CIn/UFPE) is one of the best Computer Science academic centers in Brazil and Latin America. CIn/UFPE comprises 89 PhD professors with national and international recognition in most fields of Computer Science. In particular, CIn/UFPE is ranked first in Software Engineering and Artificial Intelligence in Brazil, according to internationally recognized rankings, with papers published at prestigious international conferences[1].

Credits: Hugo Boner (leftside)); Laura Oliveira (rightside)

CIn/UFPE is the only Computer Science school in Brazil that leads two National Institutes for Science and Technology in Computer Science: INES (for Software Engineering) and IAIA (for Artificial Intelligence).

CIn/UFPE has also been closely involved in the conception and the development of Recife's information and communications technology (ICT) industrial ecosystem. Recife's technology park Porto Digital was created by CIn/UFPE professors in close collaboration with the local government, with many startups, companies and innovation centers founded by our professors and former students.

[1]https://csindexbr.org measures the Brazilian scientific production in Computer Science in selected international conferences and journals.

CIn in numbers

+2700 graduation degrees
(since its creation)

+2.400 master´s degrees
(since its creation)

+600 doctorate degrees
(since its creation)

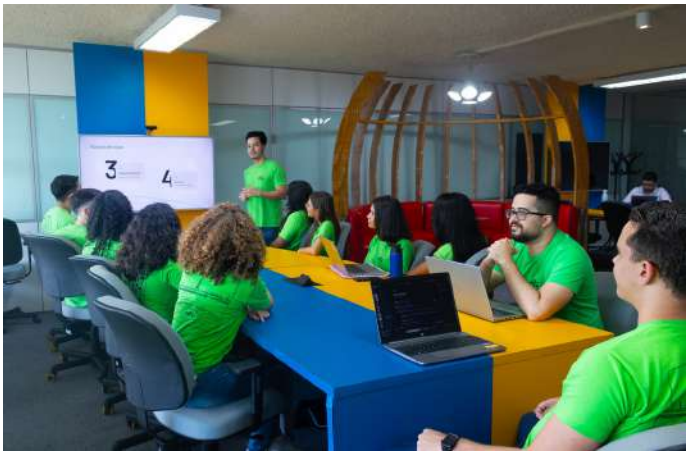
+300 researchers

+100 startups

+400 RD&I projects

One of Recife´s startup incubators

As one of the most prestigious Computer Science faculties in Brazil, CIn/UFPE has also become an important incubator for startups in Recife. More than 50 startups have been created by CIn/UFPE professors and alumni, including highly successful cases such as C.E.S.A.R, Tempest Security Intelligence, Neurotech, and Incognia.

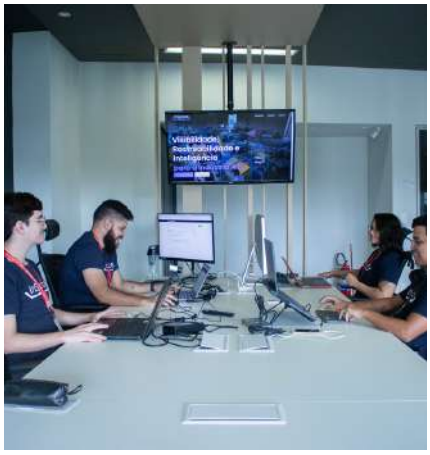


Credits: Laura Oliveira (leftside); Ana Clara Botelho (rightside)

Undergraduates enroll into a module specifically focused on entrepreneurship and innovation, thus fostering the continuous creation of startups. The CIn/UFPE pre-incubator SandPit provides support, training and mentoring for early-stage startups in addition to access to researchers, coworking spaces and a prototyping and fabrication lab CInove has several infrastructures to promote innovation and entrepreneurship in the University, including prototyping and coworking spaces, promotes events (e.g. TechSpin and Demodays).

Success Cases in RD&I Partnerships

The CIn/UFPE has held strong and long-lasting partnerships with both the public and the private sectors, and has developed research, development and innovation (RD&I) projects with companies such as Motorola, Samsung, Apple, the Brazilian Central Bank, the Brazilian Ministry of Education, Embraer, Moura Batteries, Stellantis, and many others. CIn/UFPE is also an Embrapii Unit (see our Annex I) that brings innovation to the Brazilian industry, particularly in the vehicular systems industry.



Credits: Laura Oliveira

Motorola

CIn/UFPE has been collaborating with Motorola since 2002 in research, development and innovation in Software Testing using Robotics, Artificial Intelligence, Software Engineering and Computer Vision. In addition, CIn and Motorola are pioneers in Brazil in the educational model called technological residency: a graduate course inspired by the medical residency in which the student spends part-time in the classroom and part-time in the company.

Samsung

Samsung and CIn/UFPE have founded the Centre for Excellence in Health, Well-Being and Artificial Intelligence that works in the specification and creation of new technologies, paradigms and standards to apply Artificial Intelligence to health and well-being. Samsung has been working with CIn/UFPE since 2005

Apple

Apple has established an Apple Developer Academy at CIn/UFPE. At the CIn/UFPE Apple Academy, multidisciplinary undergraduate students are trained to solve real problems using the technologies of the Apple ecosystem. The program is based on three pillars: Computing, Design and Innovation

Brazilian Central Bank

The Brazilian Central Bank and CIn/UFPE have worked in collaboration to apply time series forecasting to the spending habits of a Brazilian citizen. Such analysis is crucial for the prediction and understanding of personal debt insolvency and provides a comprehensive tool for the Brazilian Central Bank to act preventively.

Brazilian Ministry of Education

CIn/UFPE has developed a system for the Ministry of Education that supports both teaching and management data collection in order to allow its transparent access for the educational professionals in Brazil. This solution enables a better understanding and monitoring of the educational and managerial performance of the Brazilian educational system.

Moura Batteries

The largest battery company in Brazil, Moura Batteries, and the CIn/UFPE Laboratory for Embedded Computing and Industrial Technologies (LACETI) developed a system for monitoring Battery Energy Storage Systems (BESS). A network of sensors enables automatic control of environmental factors for a BESS: gas concentration, temperature, humidity, as well as real-time images of the equipment.

Stellantis

The CIn/UFPE Laboratory of Innovation for Smart Cities (LIVE) and Stellantis have developed several RD&I projects in a fruitful collaboration that produces solutions in automotive predictive maintenance, remote vehicle access, vehicle telemetry and autonomous vehicles.

Embraer

The Brazilian aircraft manufacturer Embraer has collaborated with CIn/UFPE in two initiatives: (i) a research and development project in cybersecurity in collaboration with Tempest Security Intelligence (founded by CIn/UFPE alumni); and (ii) specialization courses in the field of embedded software and data science.

CER

The Center for Renewable Energy of the Federal University of Pernambuco (CER-UFPE) is a renewable energy research center created from the integration of the Alternative Energy Sources Research Group (FAE Group), founded in the 1970s, and the former Brazilian Wind Energy Center (CBEE), established in the 1990s.

Credits: CER´s archive

CER´s research areas

- Solar and Wind Power Forecasting
- Fault Diagnosis and Prognosis of Remaining Useful Life
- Water pumping and desalination technologies
- Development of computational tools and Digital Twins
- Climate projections
- Performance analysis
- Satellite Image Processing
- High-precision Optics for Concentration in Solar Systems

UFPE is a pioneer in wind and solar energy and has achieved significant milestones in Brazil, such as the installation of the first large commercial wind turbine in the country and the creation of the first Brazilian guide for connecting wind turbines to the electricity grid. Other achievements include, for example, the first Brazilian solarimetric atlas, the most important outdoor testing area for photovoltaic systems in Brazil (CRESP, funded by ELETROBRAS CHESF, in Petrolina, Pernambuco), and the development of advanced computer tools for predictive maintenance of wind turbines.

CER-UFPE has great expertise coordinating RD&I projects with companies that face compulsory RD&I spending in Brazil in the electricity sector.

Predictive Maintenance of Wind Turbines

The project, funded by CPLF (one of the most important power companies in Brazil), aims to develop the most daring operational computational tool in Brazil for assessing deviation factors in the generation of wind turbine generators and assisting in decision-making by operation and maintenance teams, based on the state-of-the-art in Artificial Intelligence techniques and physical-numerical modelling for fault detection and diagnosis, and prognosis of remaining useful life.

High Concentration Photovoltaic Power Plant

In partnership with the Spanish energy technology company ABENGOA, CER-UFPE developed a 10 kW high concentration photovoltaic power plant connected to the local grid. The project involved the installation, commissioning, and monitoring of a high concentration system (1000 suns) connected to the power grid, evaluating the operational behavior, the accuracy of the tracking system, and the cell performance under different conditions (spectrum, temperature, and irradiance).

Improving Wind Turbine Control Strategies

The project, funded by PETROBRAS, aims to adapt a 2 MW wind turbine generator to Brazilian wind conditions, in order to maximize energy yield and minimize mechanical loads on the wind turbine operating under specific meteorological conditions in Brazil.

Venture builders: accelerators, incubators, and others

Accelerators, incubators and other venture builders

JUMP is one of the accelerators/incubators within NGPD. It works with companies in several stages of development, from pre-incubation to acceleration. JUMP benefits from the infrastructure of Porto Digital, with labs, coworking, meeting rooms and other facilities to help their startups.

Armazém da Criatividade (creativity storage, in free translation) is a decentralized incubator managed by NGPD, located in Caruaru (130km from Recife).

CESAR Ventures is an initiative that helps develop local startups with mentorships and trainning. It also helps those business secure financing through connections with investors and strategic partners.

i.de.i.a.S is a local incubation program developed by Senac Pernambuco, an agency focused in training local workforce in several sectors related to trade and services. The program provides workspaces, mentorships, and training.

Parqtel has its own 2-year-incubation program, caled Inbarcatel, focused in agrobusiness, transformation industry, social technologies, and civil construction, as well as strategic technologies and sectors (AI, photonics and games).

The Incubator from the Federal University of Pernambuco's Center of Informatics has a 10 month program for alumni of all courses. SandPit provide mentorship, technical guidance, promote events and connect entrepreneurs with market actors to analise their value proposal and build network.

Universities and other higher education institutions

UFPE

The Federal University of Pernambuco is a public educational institution founded in 1946. It currently has more than 80 undergraduate courses in Recife alone, and is rated as one of the best universities in Brazil, among public and private colleges, coming in 10th place in the Folha University Ranking in 2023.

UFPE also stands out in the CWTS Leiden Ranking 2024, as the best-rated university in the North/Northeast. Accourding to QS Latin America 2024, UFPE is the 13th best University in Brazil, and 38th in South America. In the Scientific Impact indicator, UFPE ranks 11th in Brazil, 14th in South America and top 4.3% in the world.

Credits: ASCOM / UFPE

UFPE hosts 8 national institutes of science and technology, which support high-impact scientific research in strategic areas for the country such as photonics engineering, software, innovation, pharmaceutical, virtual herbarium of plants and fungi, etc.

International level programs

UFPE has 12 courses with grades 6 and 7 from CAPES, which are the highest grades for doctoral programs and indicate a high international standard of performance, demonstrating the quality of the institution's courses. CAPES takes into account factors such as:

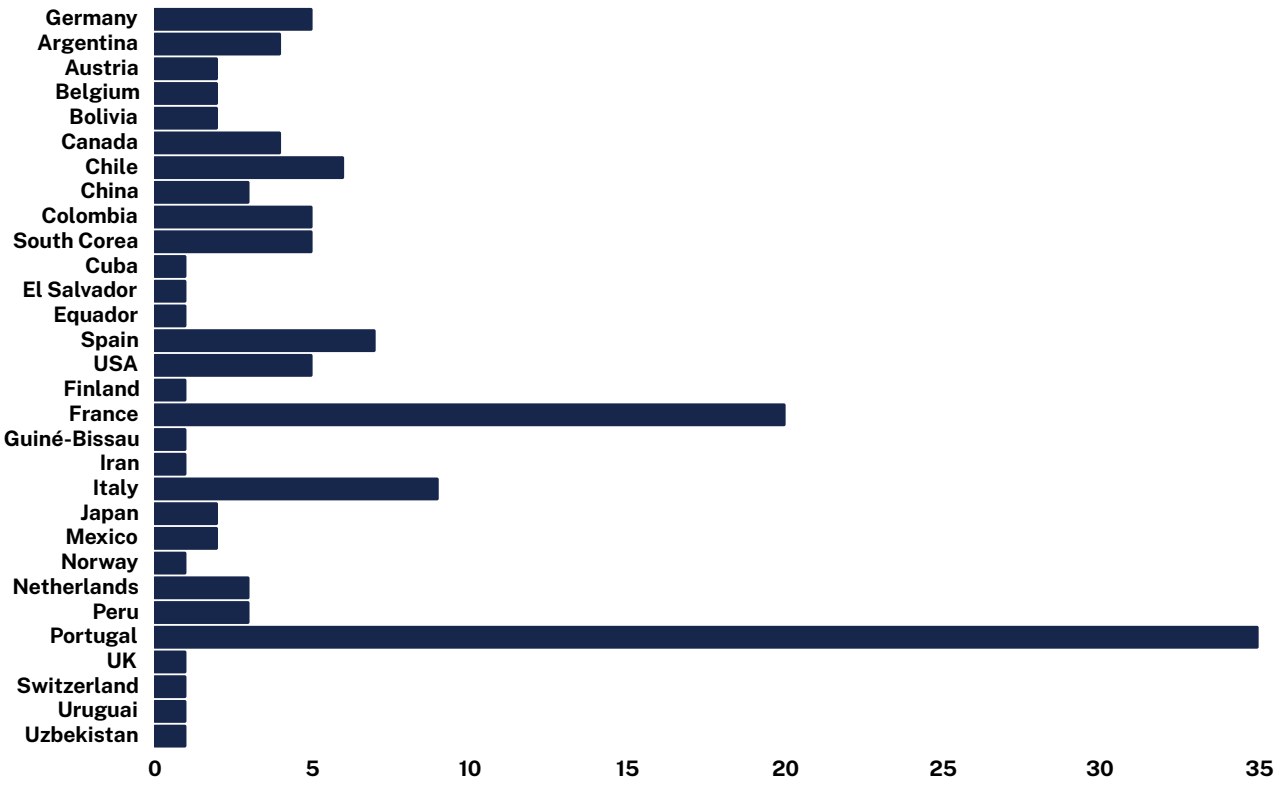
- Evaluation of stricto sensu postgraduate courses;
- Access to and dissemination of scientific production;
- Investment in the training of high-level resources at home and abroad;
- Promoting international scientific cooperation;
- Induction and promotion of initial and continuing teacher training for basic education in classroom and distance learning formats.

Grade 6	Grade 7
Animal Biology	Computer Science
Fungus Biology	Production Engineering
Biotechnology	Plant Biology
Political Science	Physics
Economy	
Civil engineering	
Social Service	
Biological Sciences	

Credits: Eugenia Bezerra

International cooperation

UFPE has more than 110 instruments of cooperation with international entities from 30 countries. These instruments allow exchange of students and other forms of international cooperation. Click here to see all partner institutions.



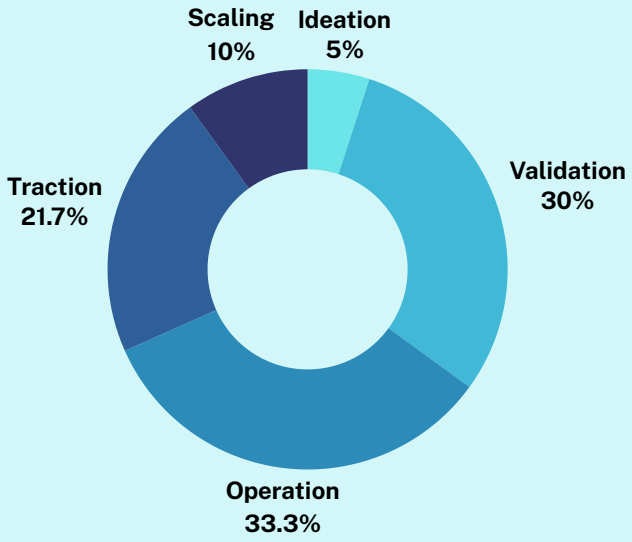
Startup ecosystem

Recife´s startup ecosystem

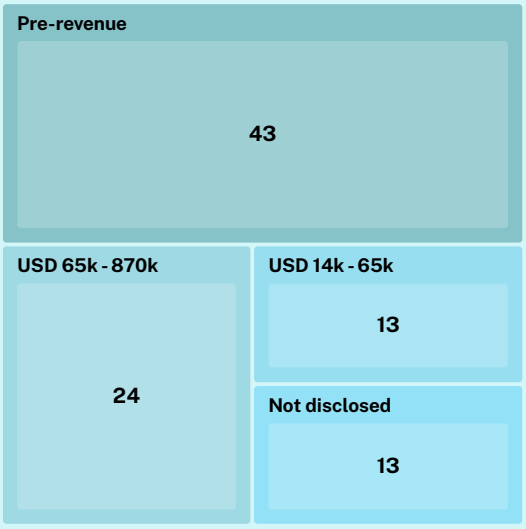
Data on startup ecsystems are always tricky, as these companies often are informal and short-living. To provide a glimpse on the local startup reality, this report used the Startups Observatory, a data aggregation platform developed by SEBRAE - a quasi-public institution that suports SMEs in Brazil.

Accourding to the platform, in 2023 there were **119 startups in Recife and 183 in the state of Pernambuco**. This represents 12% of the startups amongst the 9 states of the Northeast region. The data shows a maturing ecosystem with almost 2/3 of startups in validation/operation stages, and almost 1/3 in traction/scaling stages. More than 35% of the maped startups are in pre-revenue stage

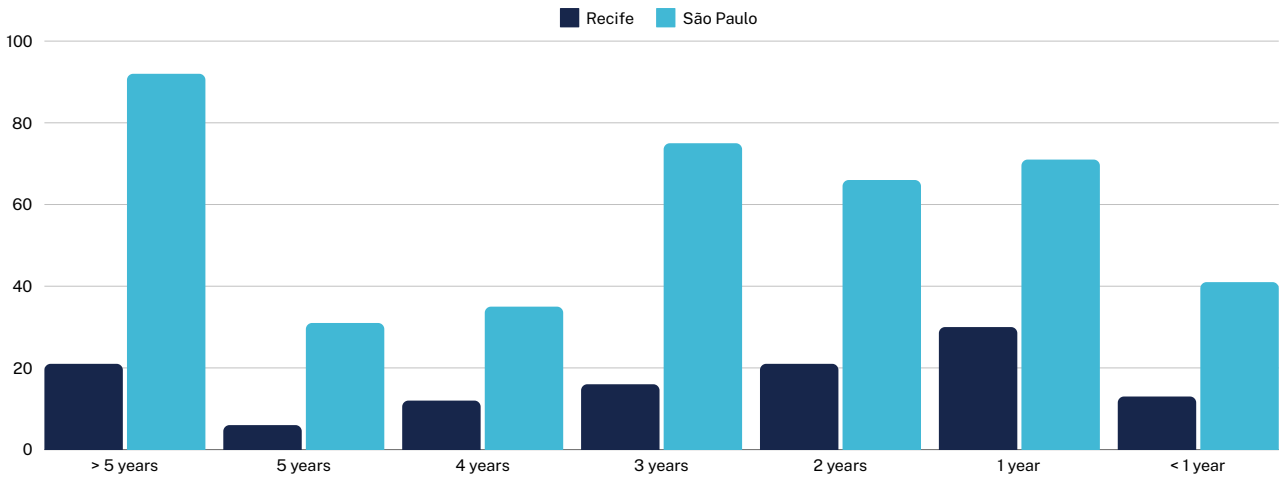
Maturity level of startups



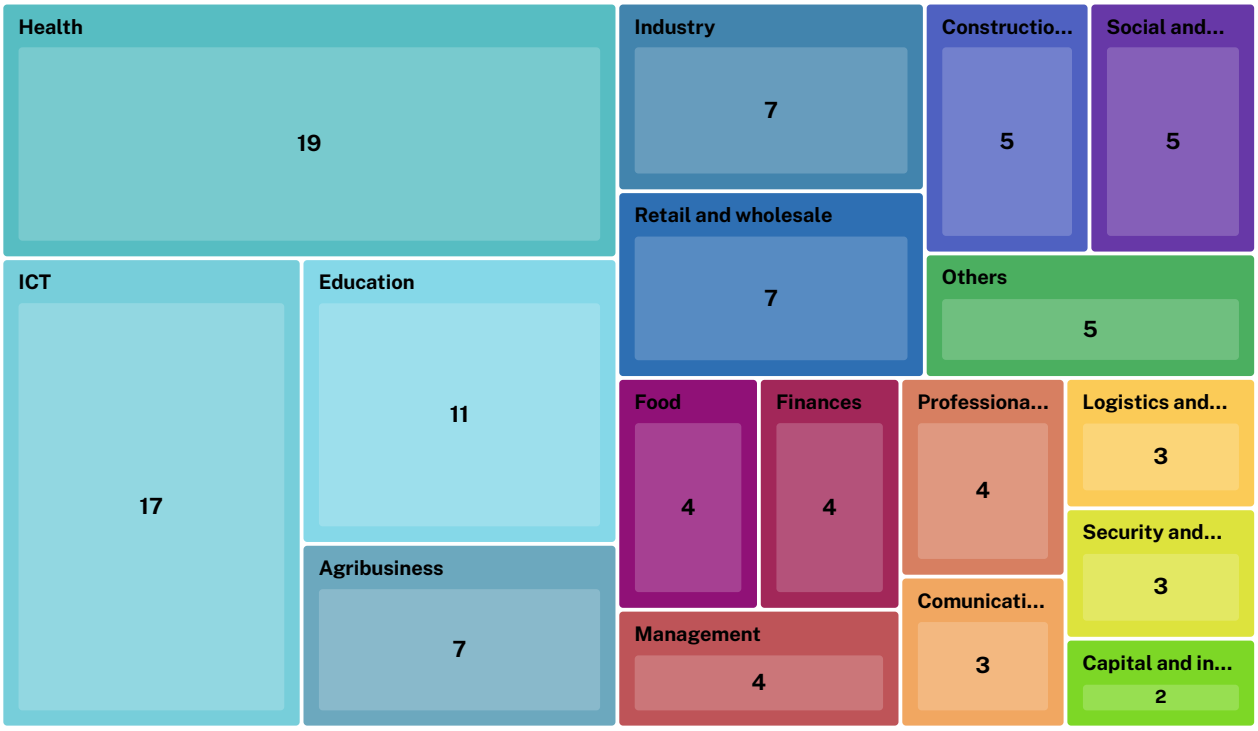
Annual revenue



More than half of these companies are up to 2 years old, and only 17% have more than 5 years since their creation. These numbers are not that different from, for example, Brazil´s most advanced ecosystem - São Paulo (43%, and 22% respectively).



The main startups sub-sectors are health (15%), information and comunication technologies - ICT (14%), and education (9%). This is not a surprise when we take into account that Recife is both a health services hub and an ICT powerhouse in Brazil.



Feedbacks

Let us know how can we improve

Scan or click the QR code to access our feedback form!

Contacts

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ANNEX I - Embrapii

The Brazilian Company for Industrial Research and Innovation - Embrapii - is a Brazilian social organization whose mission is to support innovation and the development of new technologies in Brazilian companies.

Embrapii Units

Embrapii fulfills its mission through a network of accredited Science and Technology Institutes (ICTs) - the Embrapii Units. There are currently 96 accredited Embrapii Units in all regions of the country.

AMAZONAS
INDT
IFAM

PARÁ
ISI Tecnologias Minerais
UFOPA
UFPA

TOCANTINS
UFT

DF
Embrapa Agroenergia

GOIÁS
IF Goiano
CEIA/UFG
IFG

SANTA CATARINA
Polo/UFSC
CERTI
ISI Laser
IF-SC
ISI Embarcados
CIEnP
MOVE/UFSC

MATO GROSSO DO SUL
ISI Biomassa
AgroTech/UFMS

RIO GRANDE DO SUL
LAMEF/UFRGS
ISI Polímeros
ISI Metalmecânica
INRI/UFSM
ITEC/FURG
UCSGraphene
SIMOB/UFRGS
InovaAgro/UFPel

PARANÁ
LACTEC
ISI Eletroquímica
ISI Engenharia de Estruturas

CEARÁ
IF-CE
LESC/UFC
Instituto Atlântico

RIO GRANDE DO NORTE
IMD/UFRN
CRTM-IFRN

PERNAMBUCO
CESAR
CIn/UFPE
CETENE
LITPEG/UFPE
ISI Tecnologias da Informação e Comunicação

ALAGOAS
EDGE/UFAL

PARAÍBA
CEEI/UFCG
CEAR/UFPB
IF-PB
NUTES/UEPB

BAHIA
Senai Cimatec
IF-BA

SÃO PAULO
CEINFAR/USP
CIM/UNIFESP
UFSCar
CTIM/UFABC
CCM/ITA
Poli/USP
ICMC/USP
IFSC/USP-SC
IQ/USP
E-RENOVA/UNICAMP
TECNOGREEN/USP
CQMED/UNICAMP
ESALQ/USP
CPqD
Eldorado
CNPEM
SENAI/SP
IFSP
IPT BIO
IPT MAT
FMRP/USP
CTI Renato Archer
Wernher Von Braun
FITec Campinas
LSI-TEC
Embrapa Instrumentação
Powertrain/USP

RIO DE JANEIRO
INT
COPPE/UFRJ
IF Fluminense
Tecgraf PUC-Rio
ISI Biossintético
ISI Química Verde
CETEM
IDOR

MINAS GERAIS
IFMG
DCC/UFMG
Inatel
FEMEC/UFU
IF Sul de Minas
ISI MLE
UFMG PowerTrain
UFMG Fármacos
UFOP
ZETTA/UFLA
DEF/UFV
IF Triângulo Mineiro
FITec Belo Horizonte
CTNano

Fonte: Apresentação institucional da Embrapii

What does it take to become an Embrapii Unit?

Infrastructure of excellence

Highly qualified human Capital

Focus on technology tracking

Experience in PD&I with the private sector

How does Embrapii's financial support model work?

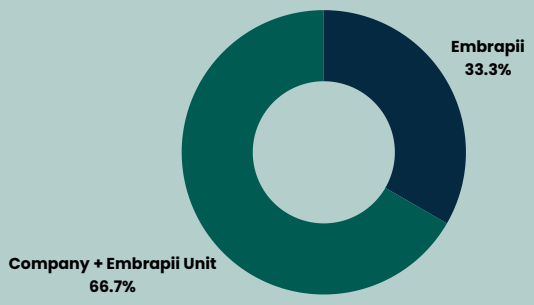
In Embrapii's financial support model, companies negotiate and approve PD&I projects directly with the Embrapii Units. Approved projects receive non-reimbursable funds from Embrapii, in a shared risck model, according to the models below:

How does (traditional) Embrapii financial support works?

Embrapii provides non-refundable funds

Company provides financial resources

Embrapii Unit provides economic resources
(human capital, research facilities, etc)

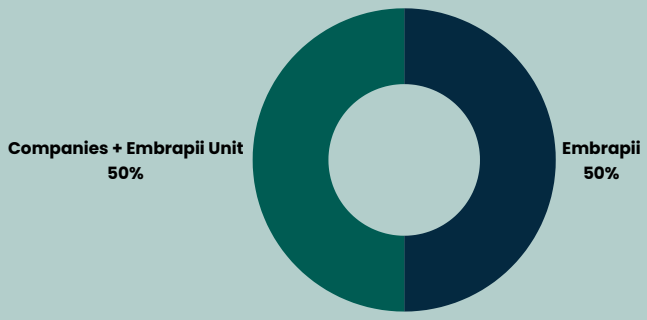


Small and medium-sized companies

(companies with annual turnover of less than R$ 90 million)

Embrapii can contribute up to 50% of the project's value

Sebrae can fund up to 90% of the company's financial contribuition



Areas of activity

Biotechnology

Materials and Chemistry

Mechanics and Manufacturing

Information and Communication Technology

Applied Technologies

International cooperation

There is no single model for international cooperation involving Embrapii. The basic conditions for Embrapii. The basic coditions for Embrapii support remain the same as for national projects, i.e. involving the participation of an Embrapii Unit and a Brazilian company.

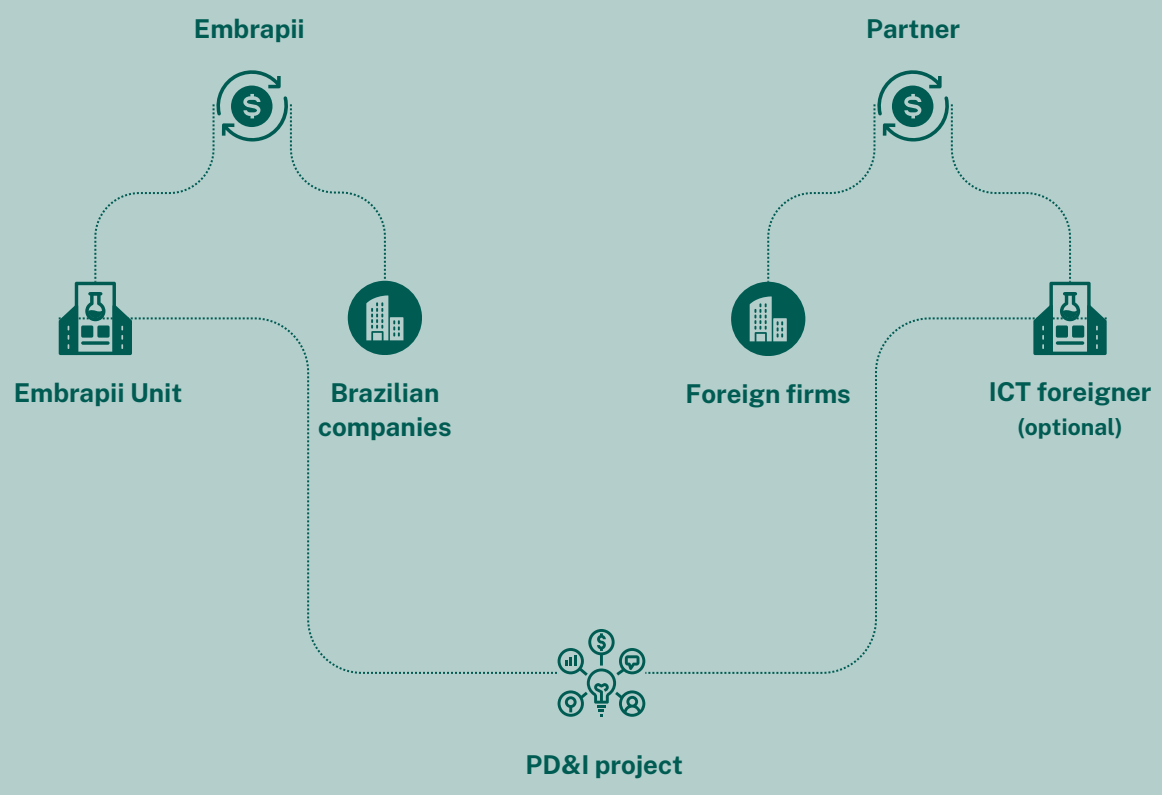
In most cases, however, bilateral cooperation takes place through partnerships between Embrapii and a foreign development agency, by means of a call for tenders.

Joint announcements

Embrapii currently has partnership agreements with development agencies or programs in 12 countries, as well as the European Union, with aim of promoting PD&I projects.

In the joint projects developed under these partnerships, Embrapii applies its fuding model to the Brazilian stage of the project (company + Embrapii Unit). The partner funding agency or program supports the partner country satge.

How does it work?



However, it is possible for foreign companies to carry out PD&I projects in partnership with Brazilian companies and Embrapii units without using joint calls for proposals. In this case, Embrapii's financial support only goes to the brazilian part of the project.

Embrapii's internacional partnerships

Latin America

Colombia
Partners: SENA
Uruguay
Partners: ANII

North America

Canada
Partners: NRC
United States
Partners: Space Florida

Europa

Germany
Partners: Sociedade Fraunhofer
Finlândia
Partners: Business Finland
Hungary
Partners: National Research, Development and Innovation Office
The Netherlands
Partners: TNO
United kingdom
Partners: Newton Fund ; British Council
Czech Republic
Partners: TACR
Swedish
Partners: Vinnova
Switzerland
Partners: Innosuisse
European Union
Partners: Eureka, Cornet e IraSME

Asia

Israel
Partners: Israel Innovation Authority