

# Innovation Ecosystems in Brazil

Recife



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# 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



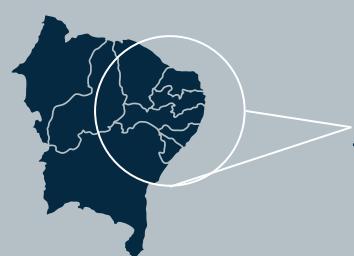
# Recife

**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 km<sup>2</sup>**

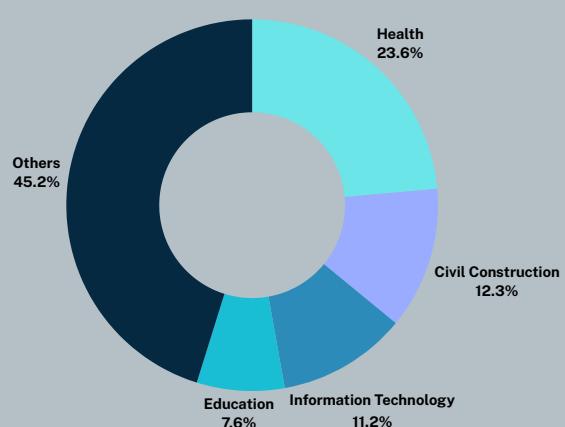


**USD 10 billion**



**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.

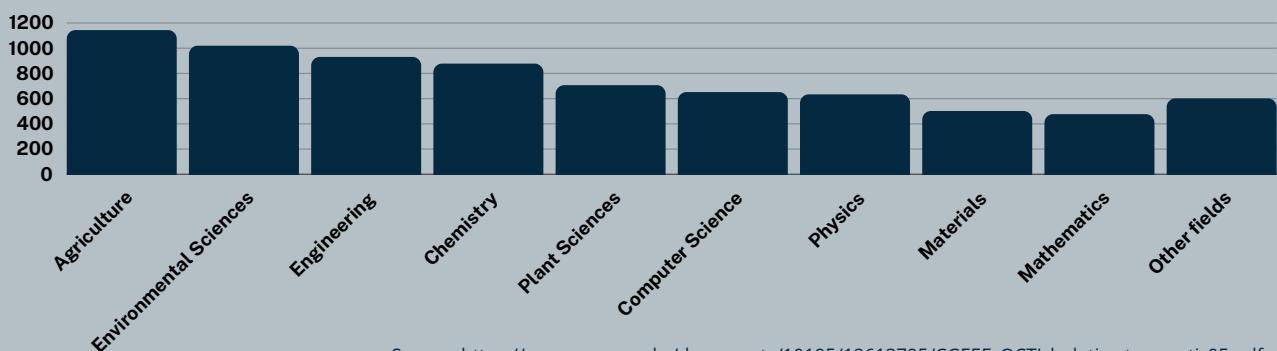
In 2020, Pernambuco state's population had 25,7 masters and 7,6 doctors per 100.000 inhabitants, above the Northeast's average (21 and 5,5), yet below the national average (28 and 8,6).

## 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 applications; electrodeposition and corrosion.
- **Chemistry:** biologic control; bioluminescence, polymers and nanostructures; pharmaceutical sector

### Main areas of research



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

Rayane Oliveira de Aguiar, Secretary for International Affairs  
E-mail: rayane.athias@assessoriaespecial.pe.gov.br

### City Hall of Recife

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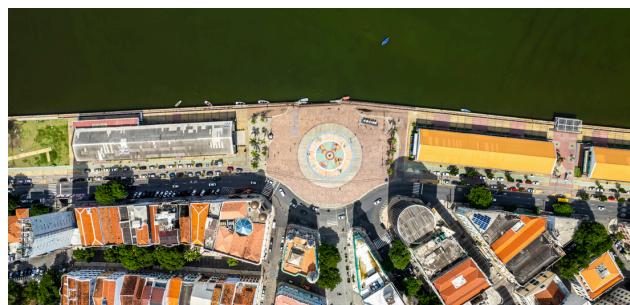
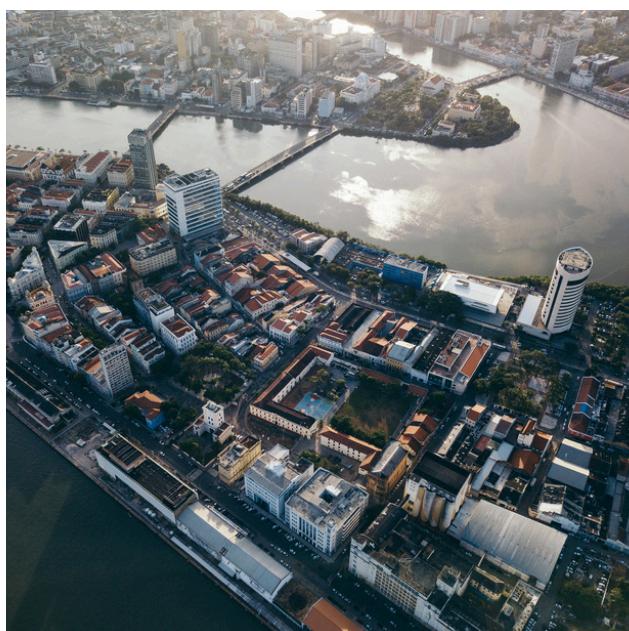


# Technology Parks



# 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 m<sup>2</sup> of historical  
buildings restored

## Main economic sectors



Software



Information & Communication  
Technologies



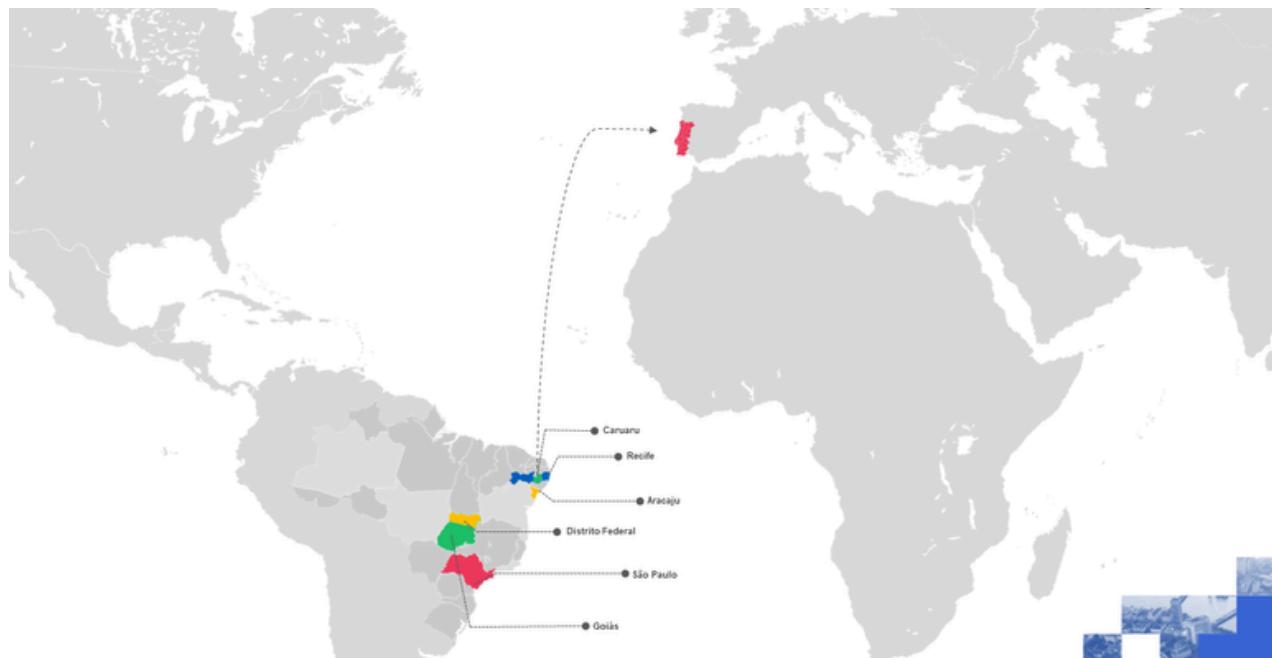
Creative  
Economy

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 customers 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.

## **Deloitte.**

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.



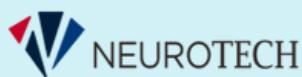
EDS is a company focused in integrating digital technologies to create solutions for client services, data intelligence, and cloud computing. The company's headquarters are located in Porto Digital.



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](mailto: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.

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## Coworkings in Porto Digital



## Point of contact in Porto Digital



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# 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

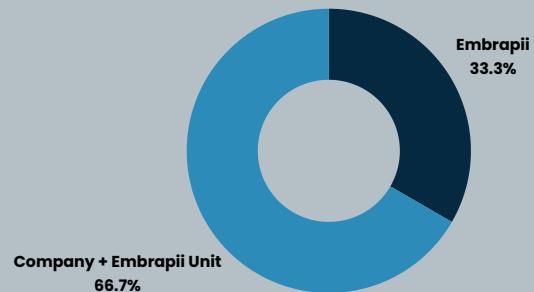
Research and Technology Organizations (RTOs) play an important role in building bridges between academia and companies by developing research, development and innovation (RD&I) projects. In Brazil, many of those organizations are either public or publicly funded entities, with links to local Universities.

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

As a proxy to access high-performing RTOs in Recife, we have included organizations registered 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 and highly-qualified human capital, as well as RD&I know-how with the private sector.

## How does (traditional) Embrapii financial support works?



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).

For this first edition, we have included CESAR, CETENE and ISI-TICs, but we hope to update the material with the other 2 RTOs very soon.

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.

# 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**

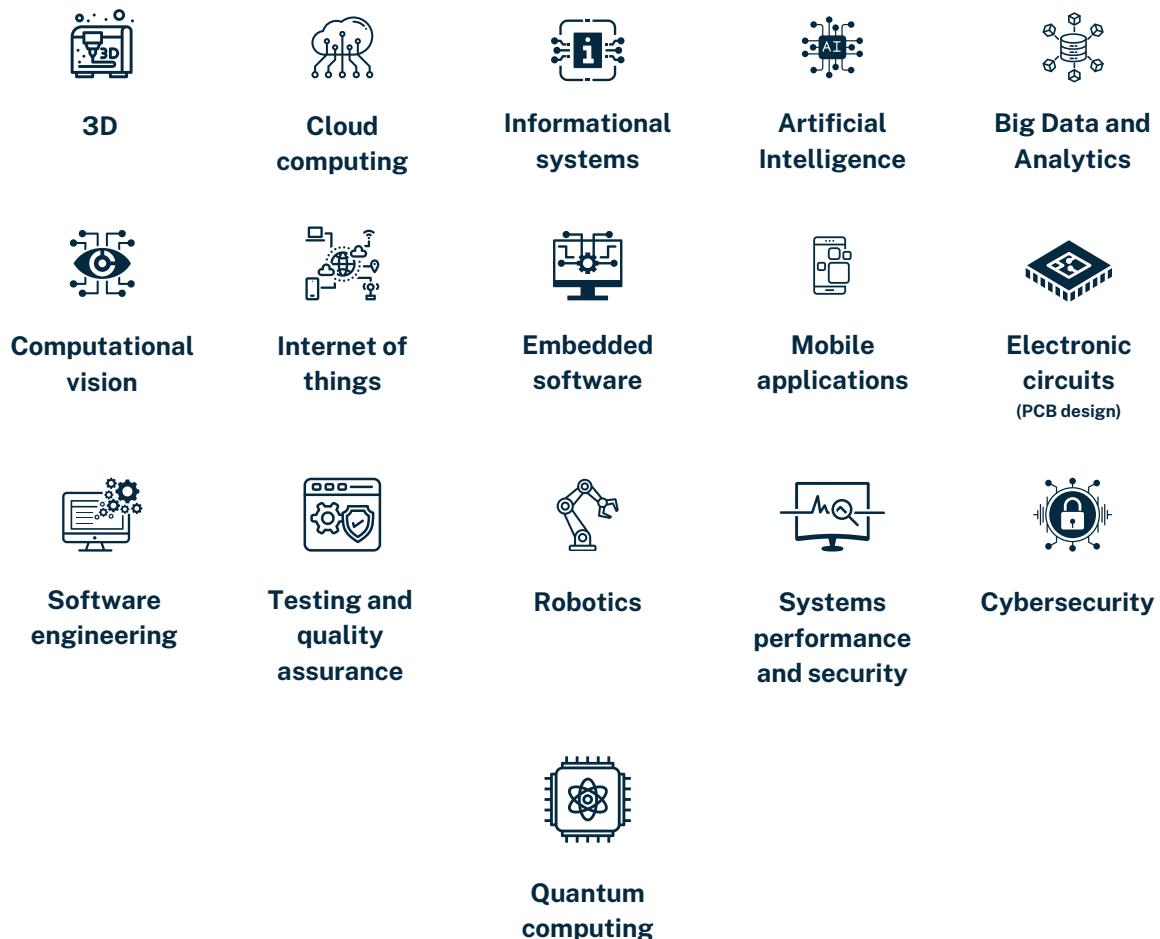


**USD 60 million  
in projects**



**80 active clients**

## Technological competences



CESAR is one of the main actors inside Porto Digital's innovation ecosystem. The Research Center contributes 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; intelligence for cyber threats; and legal, ethical, and behavioral aspects of cybersecurity.

## Blue Sky RD&I Project

The **Blue Sky RD&I project** is a collaborative 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 partnership 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



### For more information:

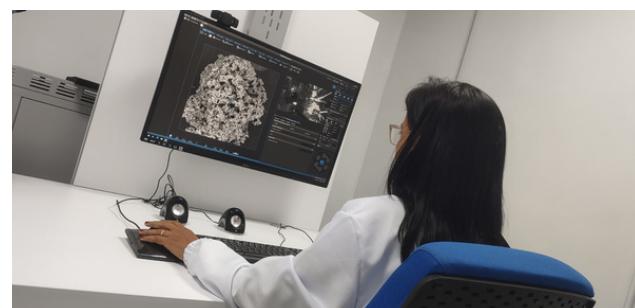
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Growth Marketing  
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### For business partnerships:

E-mail: [biz@cesar.org.br](mailto: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.



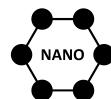
Credits: CETENE´s archive

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

<b>Nanotechnology</b>	Development of photochemical systems for clean energy production
<b>Nanotechnology</b>	Evaluation of cell growth on nanotube structures
<b>Nanotechnology</b>	Production and characterization of nanomaterials for agricultural applications
<b>Nanotechnology</b>	Production and characterization of nanomaterials for agricultural applications
<b>Nanotechnology</b>	Production and characterization of nanomaterials for use in solar energy
<b>Nanotechnology</b>	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



Internet of things



Cloud computing



Big Data and Analytics



Artificial Intelligence



Machine Learning



Software Platforms



Virtual and Augmented Reality



User Centered Design



Computer Vision



Blockchain

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 Offshore 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.

# 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 training. 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, called Inbarcatel, focused in agrobusiness, transformation industry, social technologies, and civil construction, as well as strategic technologies and sectors (AI, photonics and games).

# 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.**



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 risk model, according to the models below:

## How does (traditional) Embrapii financial support works?



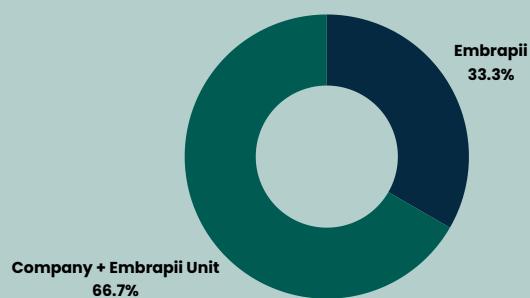
Embrapii provides non-refundable funds



Company provides financial resources



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



# Small and medium-sized companies

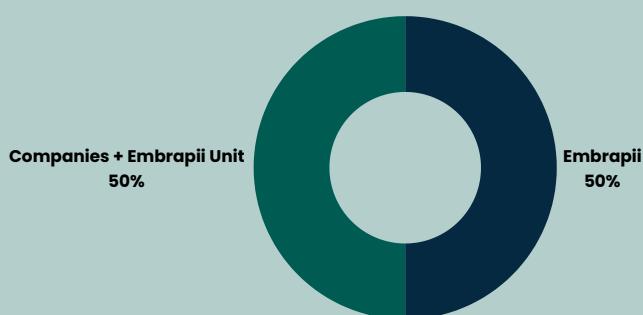
(companies with annual turnover of less than R\$ 90 million)



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



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



## 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 support remain the same as for national projects, i.e. involving the participation of an Embrapii Unit and a Brazilian company.

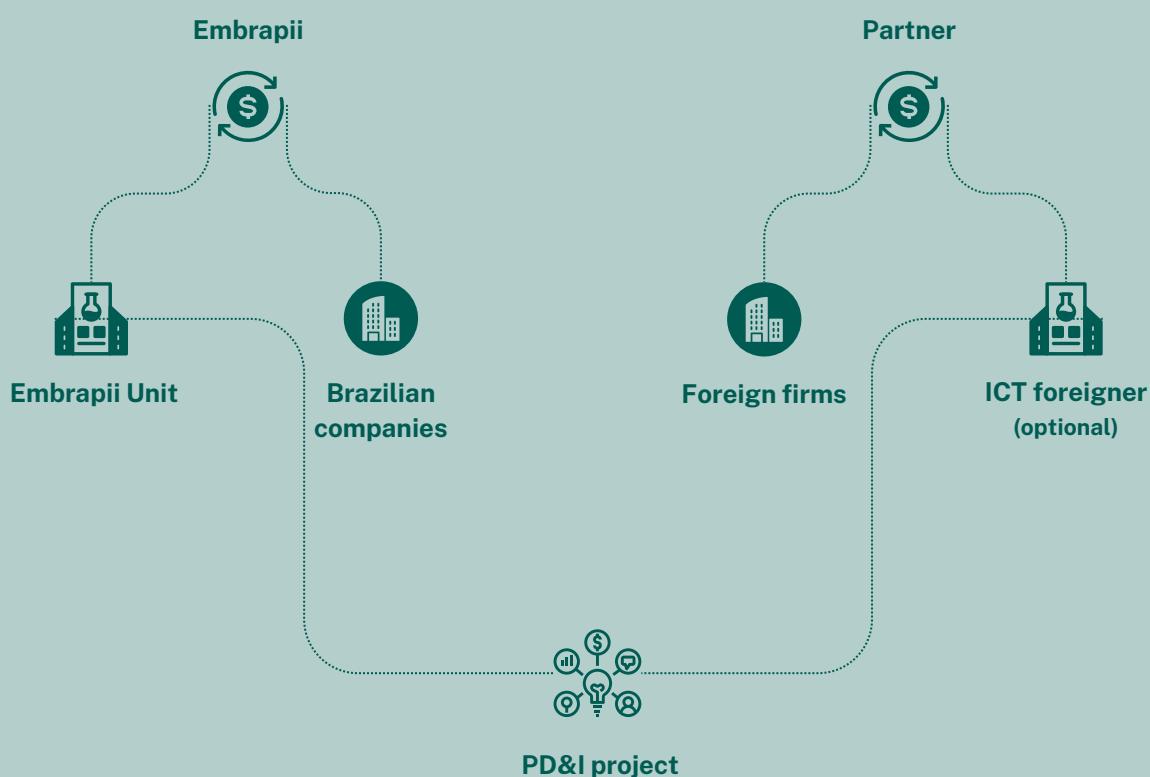
In most cases, however, bilateral cooperation takes place through partnerships between Embrapii and a foreign development agency, by means of a call for tenders.

## 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 funding model to the Brazilian stage of the project (company + Embrapii Unit). The partner funding agency or program supports the partner country stage.

## 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](#)