



*Brazilian National Confederation of Industry*

**THE FUTURE OF INDUSTRY**

# The Brazilian Industry

an inflection point

Inclusive and  
sustainable  
industrialization



**PHARMACEUTIST**



**ENERGY**



**TEXTILE**



**ELECTRONICS**



Confederação Nacional da Indústria

PELO FUTURO DA INDÚSTRIA



**BEVERAGE**



**AUTOMOBILES**



**OIL AND GAS**



**FURNITURE**



**CERAMICS**

# MAIN SECTORS



**MACHINES AND  
EQUIPMENT**



**FOOD**



**PLASTIC**



**CIVIL  
CONSTRUCTION**



**MINING**



**TOYS**



**PAPER AND  
CELLULOSE**



**INFRASTRUCTURE**



**FOOTWEAR**



**CHEMISTRY**

24

thousand own Employees

2,7

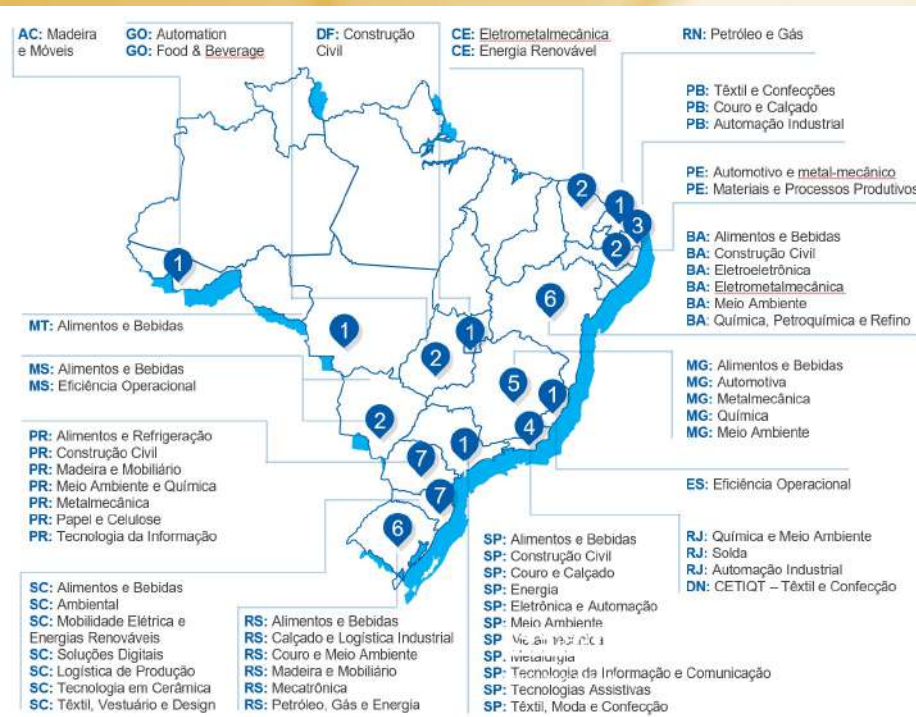
thousand Total number of municipalities where SENAI is present

## LARGEST PRIVATE PROFESSIONAL EDUCATION COMPLEX AND OF TECHNOLOGICAL SERVICES IN LATIN AMERICA



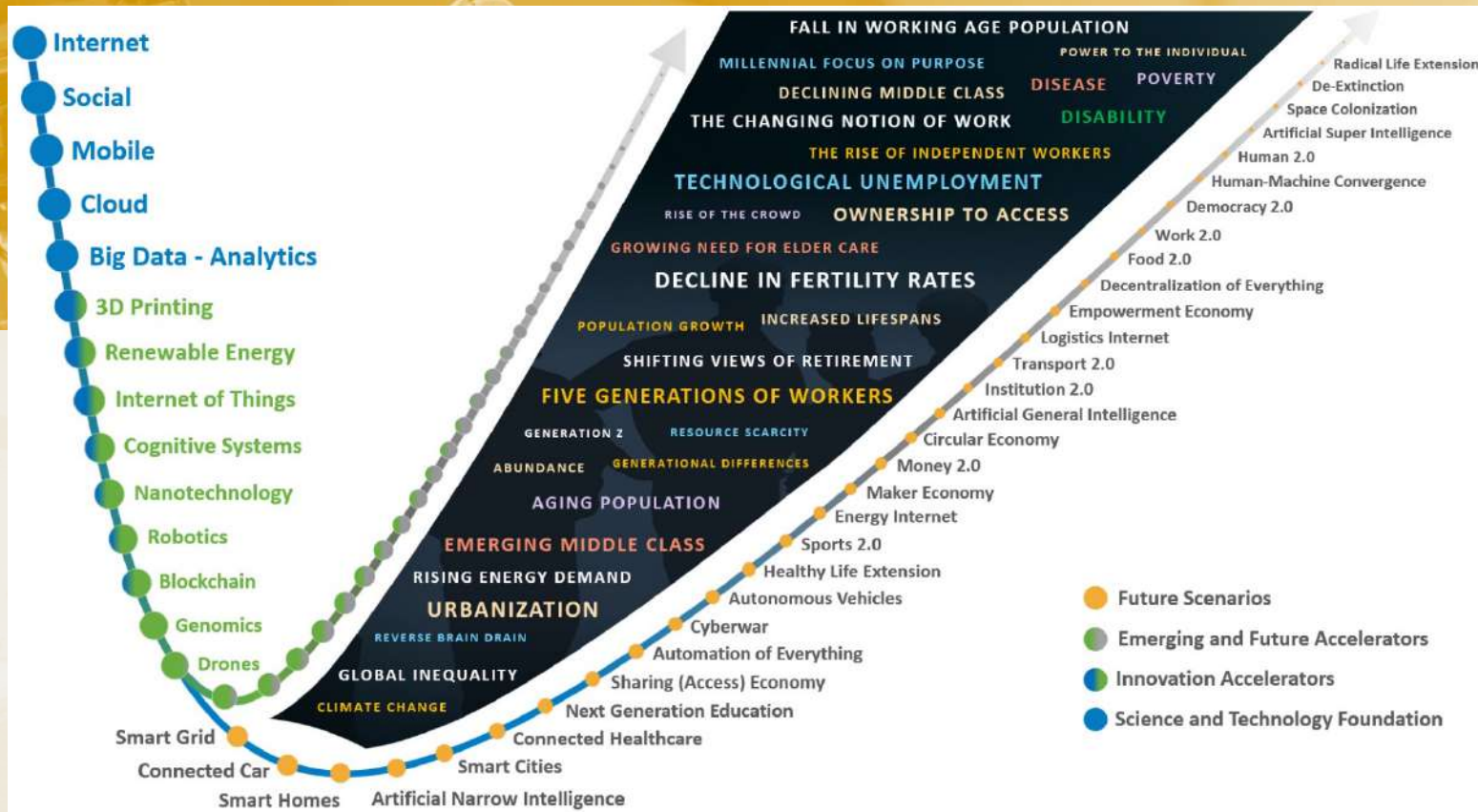
Since its creation in 1942, the organization has trained more than **80 million workers**, in 28 segments – from professional initiation to undergraduate and technological postgraduate courses.

It has also become a national reference in supporting technology and innovation for industrial companies of all sizes and segments.





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# Hype Cycle for Emerging Technologies, 2020



[gartner.com/SmarterWithGartner](https://gartner.com/SmarterWithGartner)

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**Gartner.**

**SENAI**

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# ENTREPRENEURIAL MOBILIZATION for Innovation (MEI)

MEI is a movement intended to stimulate the innovation strategy of Brazilian companies and improve the effectiveness of policies in support of innovation through constructive and lasting dialogue between the private sector, academia and the public sector

400

more than 400 executives and entrepreneurs in search of paths to enhance innovation in the Brazilian entrepreneurial sector and to assess actions already underway to stimulate innovation in the country.



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Creation of a network of SENAI Innovation Institutes, based on the Fraunhofer model.

The Fraunhofer Society and MIT are partners in the creation of the intellectual capital status



Massachusetts  
Institute of  
Technology

Business curatorship

New approach models with companies



**Fraunhofer**

Technical curatorship of the network of  
institutes

Maturity Assessment

INITIAL INVESTMENT OF  
**Aprox. US\$ 1 BILLION**

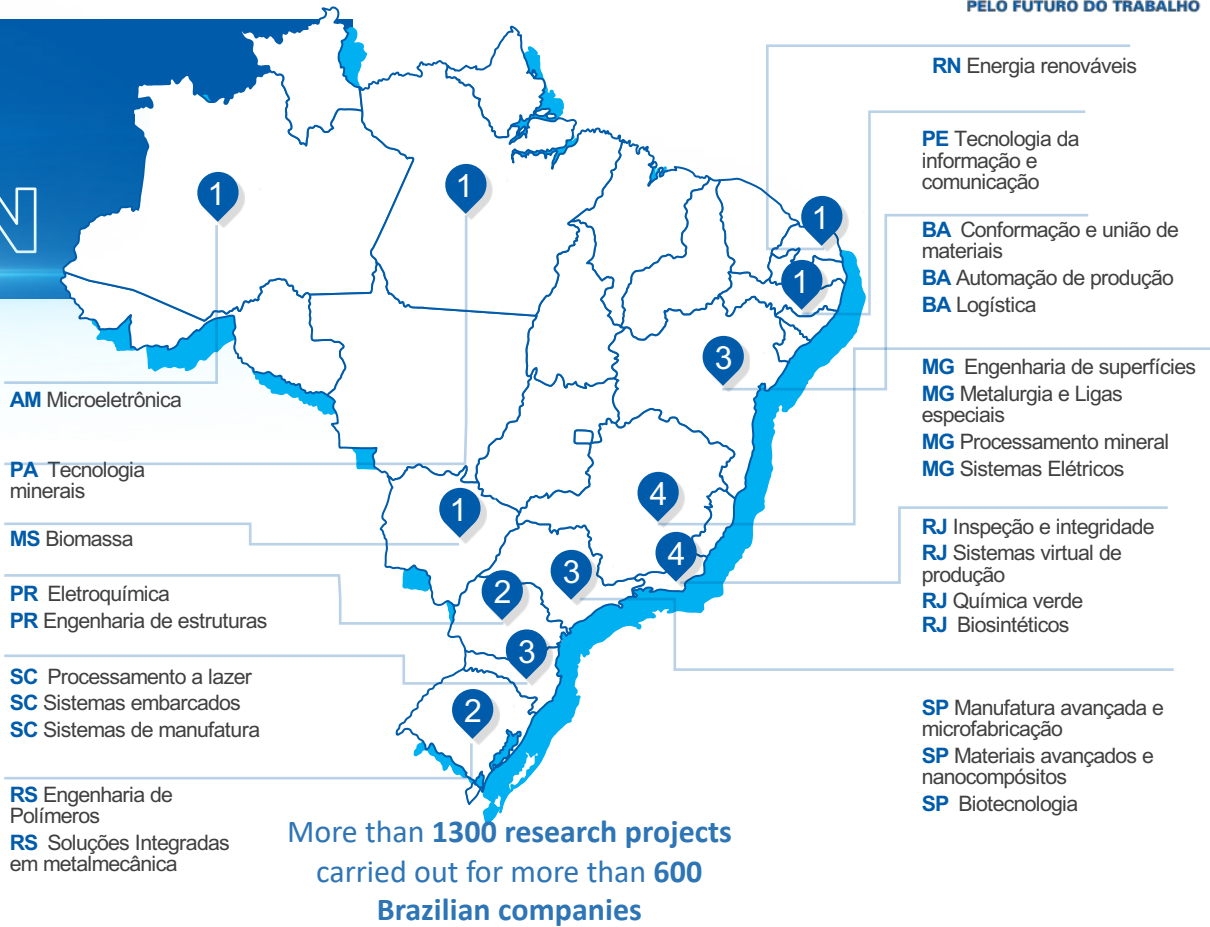
# 26 SENAI INSTITUTES OF INNOVATION

- Impact Goals
- Energy transition accomplished
- Digitalized value chain
- Fully circular economy
- Security and resilient society
- Affordable healthcare

## Lead-Market-oriented alliances



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# SENAI INSTITUTES

## STRATEGIC

## STRUCTURING



**SENAI**

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### Impact Goals

- Affordable healthcare
- Energy transition accomplished
- Digitalized value chain
- Fully circular economy
- Security and resilient society

### SENAI INSTITUTES aimed at addressing lead markets

- Mobility sector
- Digital economy
- Energy sector
- Chemical industry
- Agriculture and food industry
- Aerospace economy
- Plant and mechanical engineering
- Construction industry
- Healthcare sector

### Pre-competitive research: SENAI Strategic Research Fields

- Hydrogen Technologies
- Quantum Technologies
- Digital Healthcare
- Artificial Intelligence
- Bioeconomy
- Resource Efficiency and Climate Technologies

### Senai Alliances for:

- Energy Technologies and Climate Protection
- Resource Technologies and Bioeconomy
- Health
- Industry 4.0
- Advanced Materials

Strategy Definition based on  
Fraunhofer Model



# Industry 4.0

## SENAI Alliance for Artificial Intelligence

Develop a digital, open and multi-user data science and I-AI platform for the leverage and modernization of Brazilian industry Scientific and technological development of I-AI Design.



MINISTÉRIO DA  
CIÊNCIA, TECNOLOGIA  
E INOVAÇÕES



IPRJ  
Universidade do Estado  
do Rio de Janeiro



# CNI'S STRATEGY TO SUPPORT A LOW CARBON ECONOMY

Our proposal consists of **16 actions**, organized into **4 main themes**, where government and industry can work together, aiming at accelerating the implementation of programs and technologies to reduce GHG emission, in the short and medium term, while build the pathway for the climate neutrality in 2050

The priority themes are:

**01**

Energy  
Transition

**02**

Carbon  
Pricing

**03**

Circular  
Economy

**04**

Forest  
Conservation

# SENAI Institutes are committed to sustainable industrialization



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- Design of biosensors
- Design for circular economy
- Biocomputing
- Electromobility
- Biomaterials
- Advanced materials
- Genomic
- Carbon emission reduction
- Green energy
- **Biosynthetic and fibers**





# SENAI ALLIANCES designed for big environment and social challenges

## Boundary conditions:

1. Impact investments with focus on ESG agenda
2. SENAI Institutes are committed to “race to zero” initiative
3. Green clausulae in all research projects of SENAI Institutes
4. Global governance (all connected)
5. Blended finance
6. Transparency and accountability



Applications in  
Industry



Safety and life  
cycle



Technology  
production



Application in  
mobility and  
transport



Energy sector and  
power economy



Advanced  
Materials



Biotech

# THEME 1

# ENERGY TRANSITION

## **ACTION 1:**

Support the expansion of biofuels and the strengthening of the National Biofuels Policy (Renovabio)

## **ACTION 2:**

Articulate greater participation of industry in the energy efficiency programme (Procel)

## **ACTION 3:**

Support the government in building and implementing new regulations to support implementation of offshore wind projects in Brazil.

## **ACTION 4:**

Promote new clean technologies, such as hydrogen and CCUS

## **ACTION 5:**

Articulate public policies to encourage the production of energy from solid waste

## Action 4

# Potential of Hydrogen Economy

Reduce Emissions

Diversify Energy Supply

Foster Economic Growth

Support National Technology

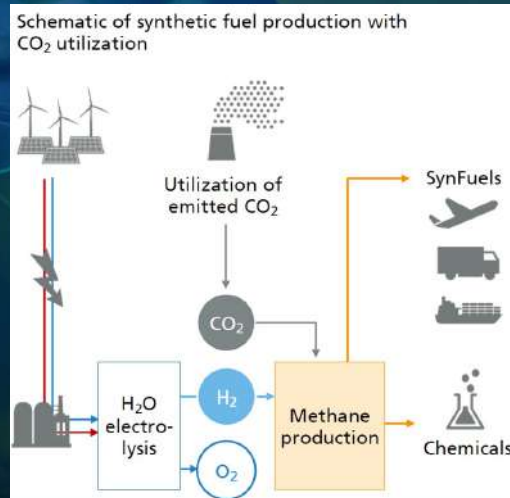
Developments

Integration of renewables

Develop Hydrogen for Export



Source: Getty Images



Source: Fraunhofer ICT

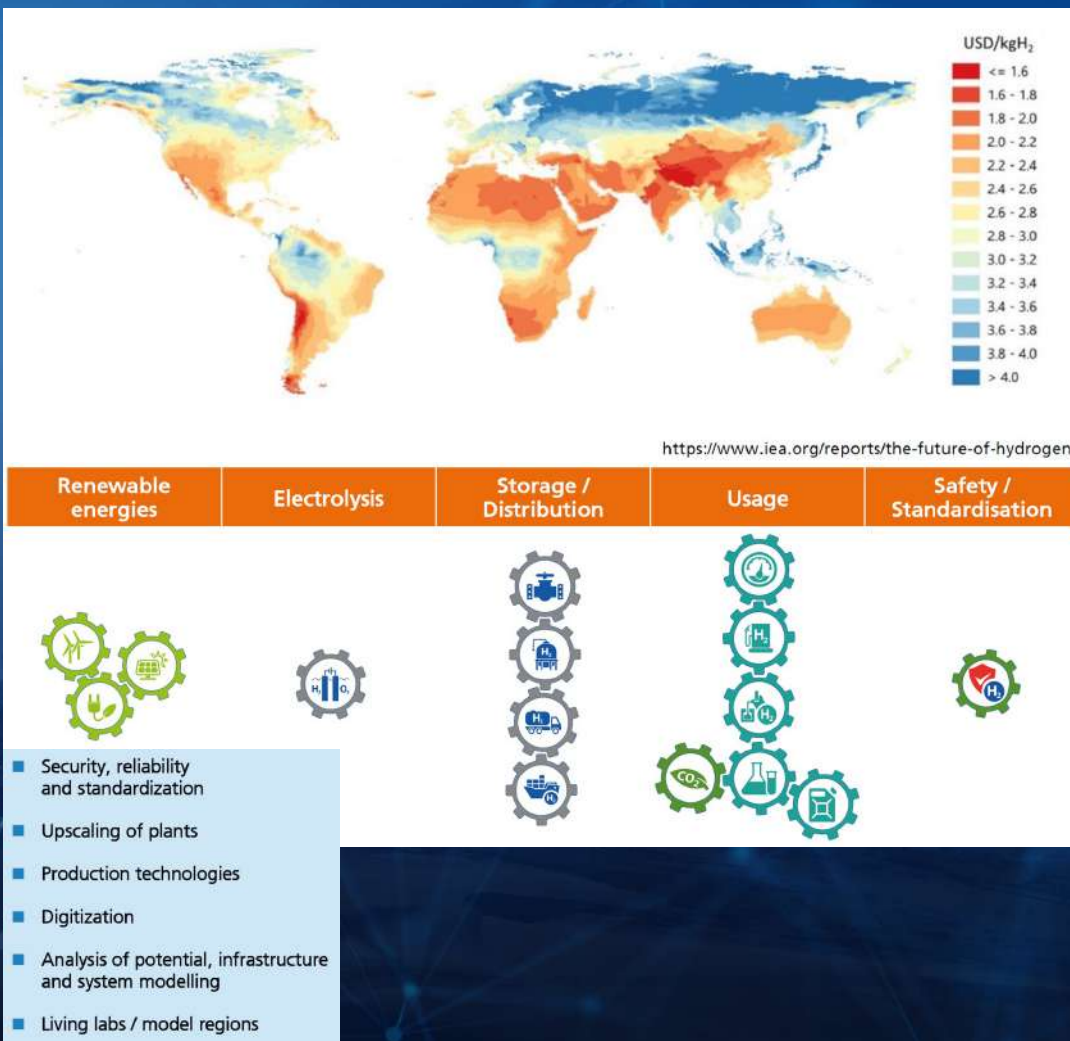


# Proposal 1

## Alliance for Hydrogen Economy

Powered By 

- CTG Call + Basic funding for RE Projects (10 million Euros Opex)
- Network of 10 Senai Institutes running projects in RE
- Integration of renewables
- knowledge internationalization



### **ACTION 1:**

Coordinate efforts for land regularization and eliminate socio-environmental conflicts in rural areas to provide legal security to producers and investors, thus creating a favorable business environment, while contributing to forest conservation

### **ACTION 2:**

Strengthen the integration among Ecological-Economic Zoning (ZEE) in the states to speed up the environmental licensing process for productive activities, provide greater security for government and private investments, and guide the titling of public lands

### **ACTION 3:**

Improve and strengthening the Public Forest Management Law to increase business attractiveness and reduce bureaucracy for entrepreneurs and public administrators

### **ACTION 4:**

Promote the bioeconomy as a vector for sustainable development of the Amazon region and maintenance of the standing forest, by attracting private investments and directing public investments to R&D&I



## **THEME 4**

# **FOREST CONSERVATION**

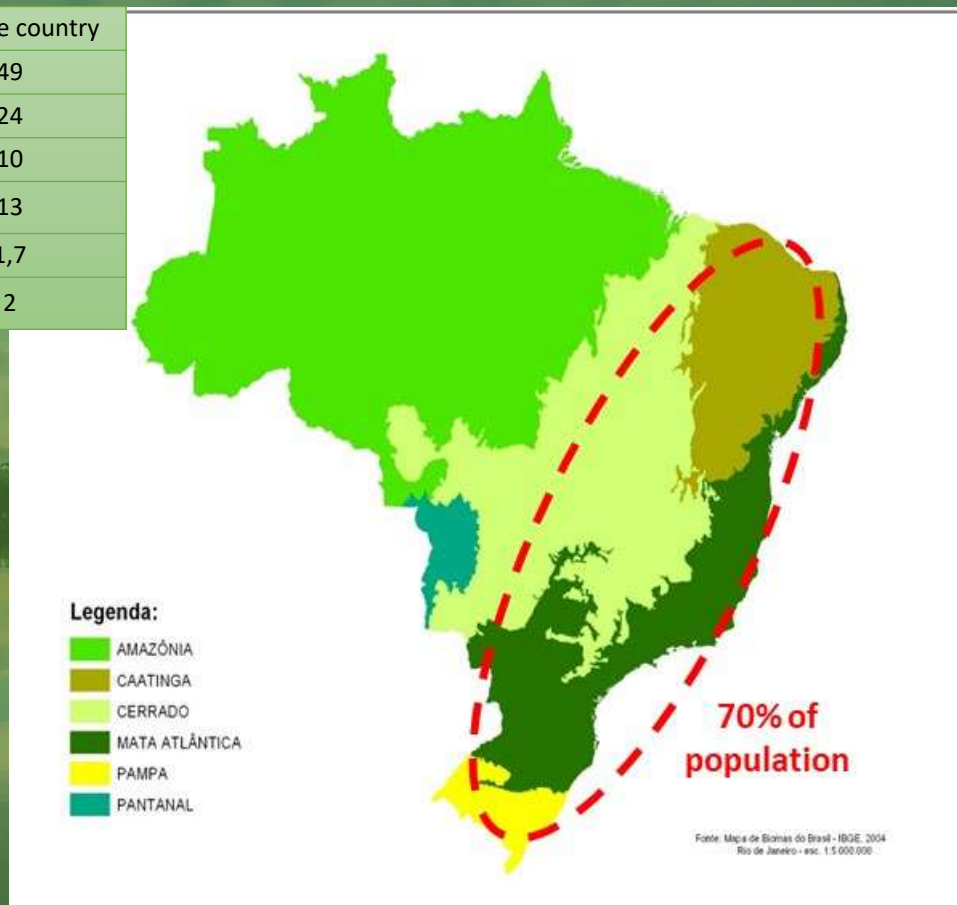
# SENAI network of innovation for Biodiversity

## Boundary conditions

The very fast advancement of Biotechnology followed by technology modernization allowed to expand and consolidate the Bioeconomy

The growing systemic crisis (economic, climatic, hydrological, food and migratory) in Brazil is contrasted by the country's biggest biodiversity with is considered a tremendous natural resource

Biomes	% of the country
Amazonia	49
Cerrado	24
Caatinga	10
Atlantic Forest	13
Pantanal	1,7
Southern Fields	2





## Mesurement of enviromental impact in the regeneration of ecosystems

Use of biosensors and biological control

Analysis of pesticides and heavy metals

"In vitro" cytotoxicity potential test

Hygienic-sanitary profile of processes and products

Molecular Markers

Microbiological assessment of effluents, environments and surfaces

Treatment and use of waste by bioremediation (biodegradation of oils, effluent treatment, bioactive extraction)

## Bioprospection: Mapping of species

Microbiology

Molecular biology

Sequencing and genetic manipulation

Bioinformatics

Biodiversity genome bank (forest and aquatic)

Genome studies with properties, products and enzymes of commercial interest

Vivarium, Nursery, Greenhouse

## New sustainable businesses

Processes and Products via Biotechnology Route

Synthetic Biology

Advanced fermentation processes

Processes and Products via Chemical Synthesis

Advanced processes under supercritical conditions

Extraction using membranes and physical techniques Amazon Bioproducts

Functional Foods

Phytocosmetics and Herbal Medicines

BioDefensives and Biofertilizers; Bioplastics; Biosurfactants and Biodetergents; Biolubricants; Biofuels

## Competitive Inteligence

Observatory for Amazon and Cerrado bioeconomy

Technical biodiversity feasibility studies

Evaluation of the competitiveness

Intellectual property analysis and regulation

Consultancy for managing biotechnological innovation

# Proposal 2: SENAI International Districts of Innovation for Biodiversity



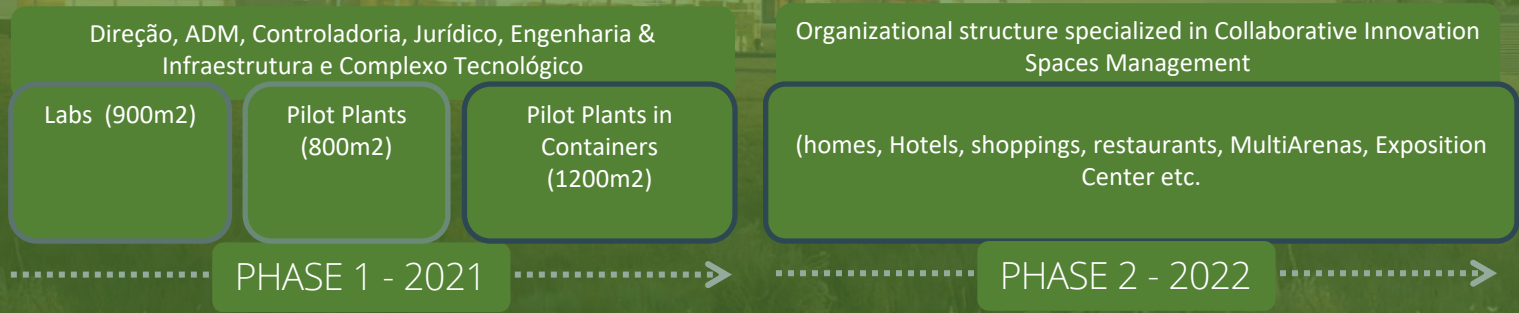
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Strategic Concept

Infrastructure of R&D&I



Infrastructure





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Learn more in the link:  
<http://institutos.senai.br/>

