



Conselho Empresarial  
**BRASIL-JAPÃO**  
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Business Council



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Policy & Action

**CNI**  
Confederação Nacional da Indústria  
CNI. A FORÇA DO BRASIL INDÚSTRIA



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# SENAI's INNOVATION AGENDA



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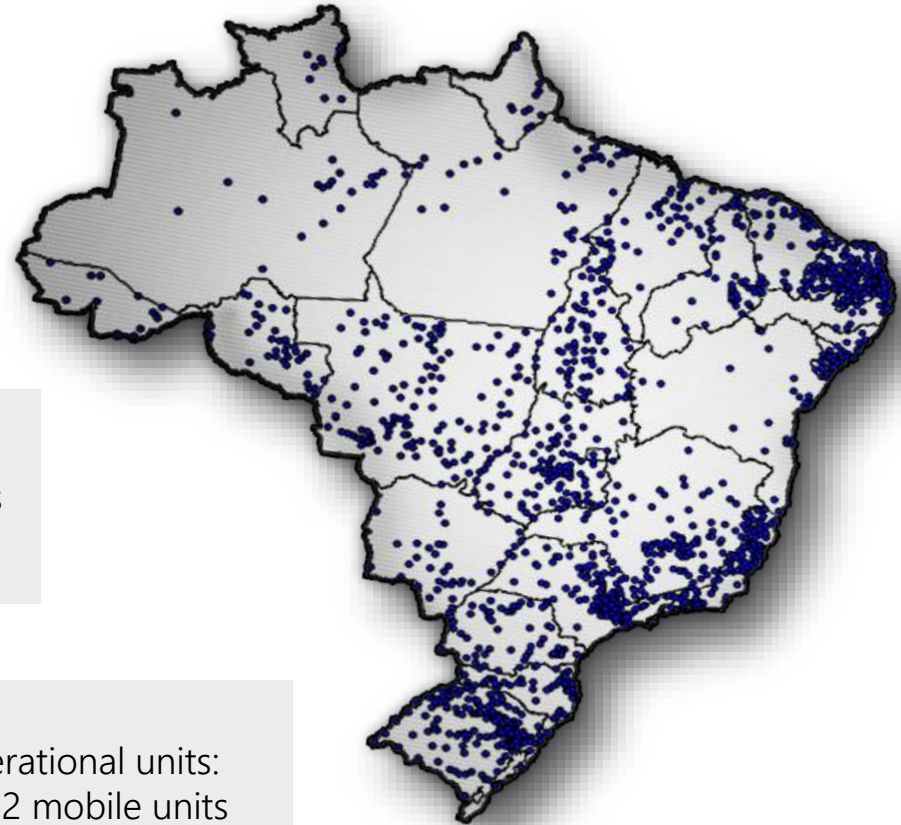
## //> SENAI | in figures

The largest private network for technical education and technological services in Latin America

2 million enrollments per year

Operating in 28 industrial sectors

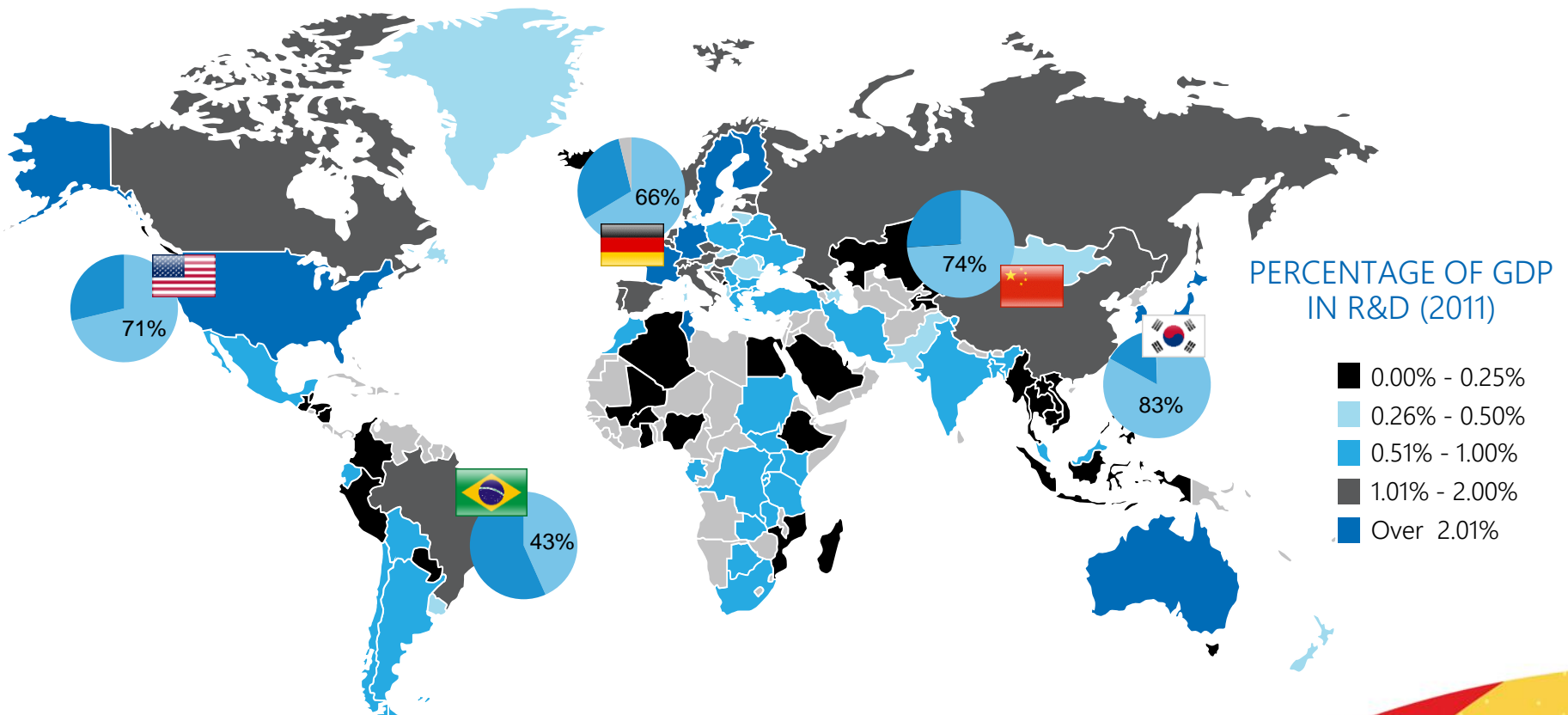
About 1,000 operational units:  
- 544 centers/452 mobile units  
- 189 laboratories  
- 31,000 employees



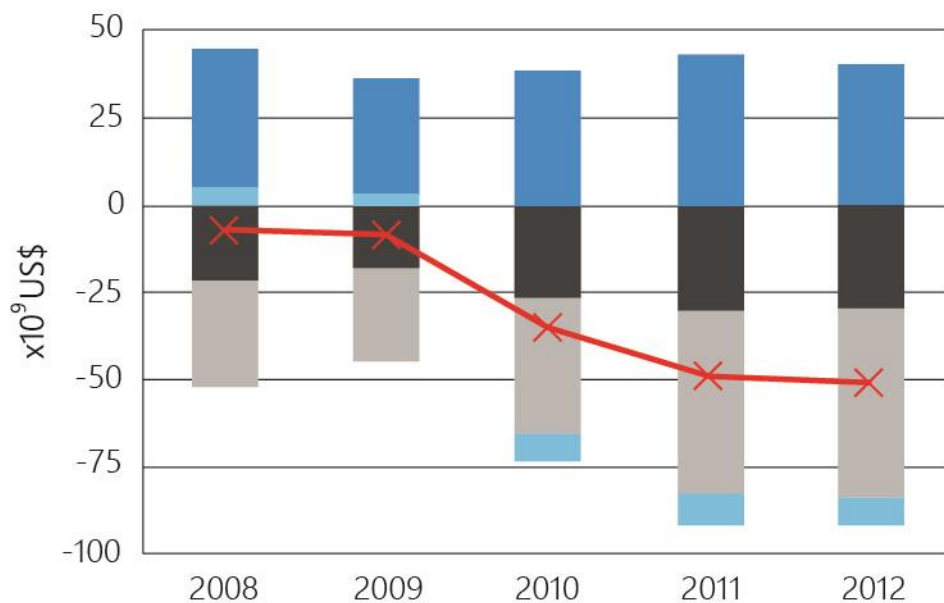


## //> Investment in research and development

Share of private investments in R&D (percentage of GDP, 2011)



## //> Evolution of the Brazilian trade balance



Record deficit of the industrial balance:  
ca. US\$ 50,600 million in 2012

### Exports:

Iron ore, soybeans, coffee, petroleum, transport equipment, automotive parts, cars, machinery

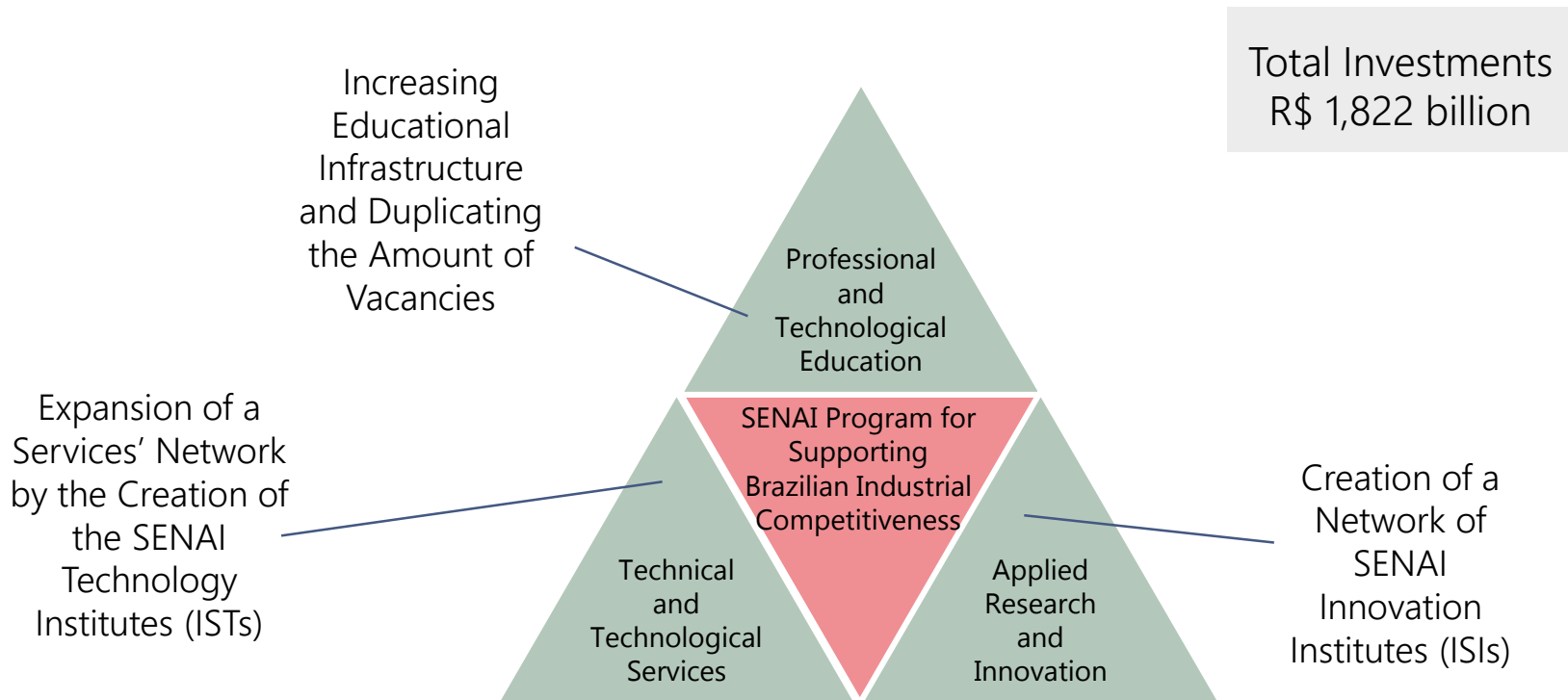
### Imports:

Equipment and consumer goods with high and mid-level technological content

Intense demand for high added value services



## //> SENAI | Program for supporting Brazilian industrial competitiveness



## //> SENAI | Professional and Technological Education

### SENAI METHODOLOGY

- . Professional profiles
- . Curricula layout and revision
- . Teaching practice
- . Data integration

### EDUCATION WORLD

- . Facilities modernization
- . Upgrade of pedagogical and administrative staff
- . Provision of teaching and learning materials
- . Technical and vocational training (initial/continuing)

### LABOR WORLD

- . Labor market demands and trends
- . Draft of laws and regulations
- . Draft of qualification and examination standards

## //> SENAI | Professional and Technological Education

### LABOR MARKET DEMANDS AND TRENDS

Analysis of  
pre-existing  
knowledge

Identify specialists  
from  
observatories  
and business

Define  
Prospection  
methodology

Execute  
Preliminary  
prospection

Co-ordinate  
discussion

Assess and apply  
the new  
knowledge



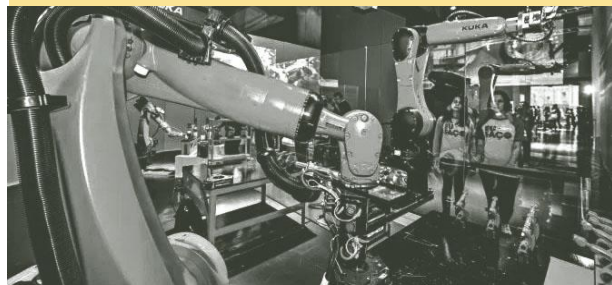


## //> Network of Innovation and Technology Institutes

### STARTUPS



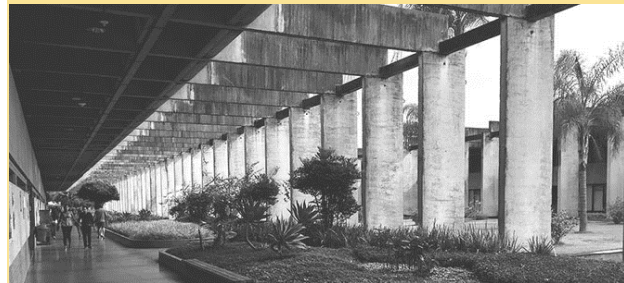
### INDUSTRY



### GOVERNMENT



### UNIVERSITIES AND R&DI



### SENAI INSTITUTES



### INTERNATIONAL INSTITUTIONS



## //> SENAI | Institutes' strategic objectives

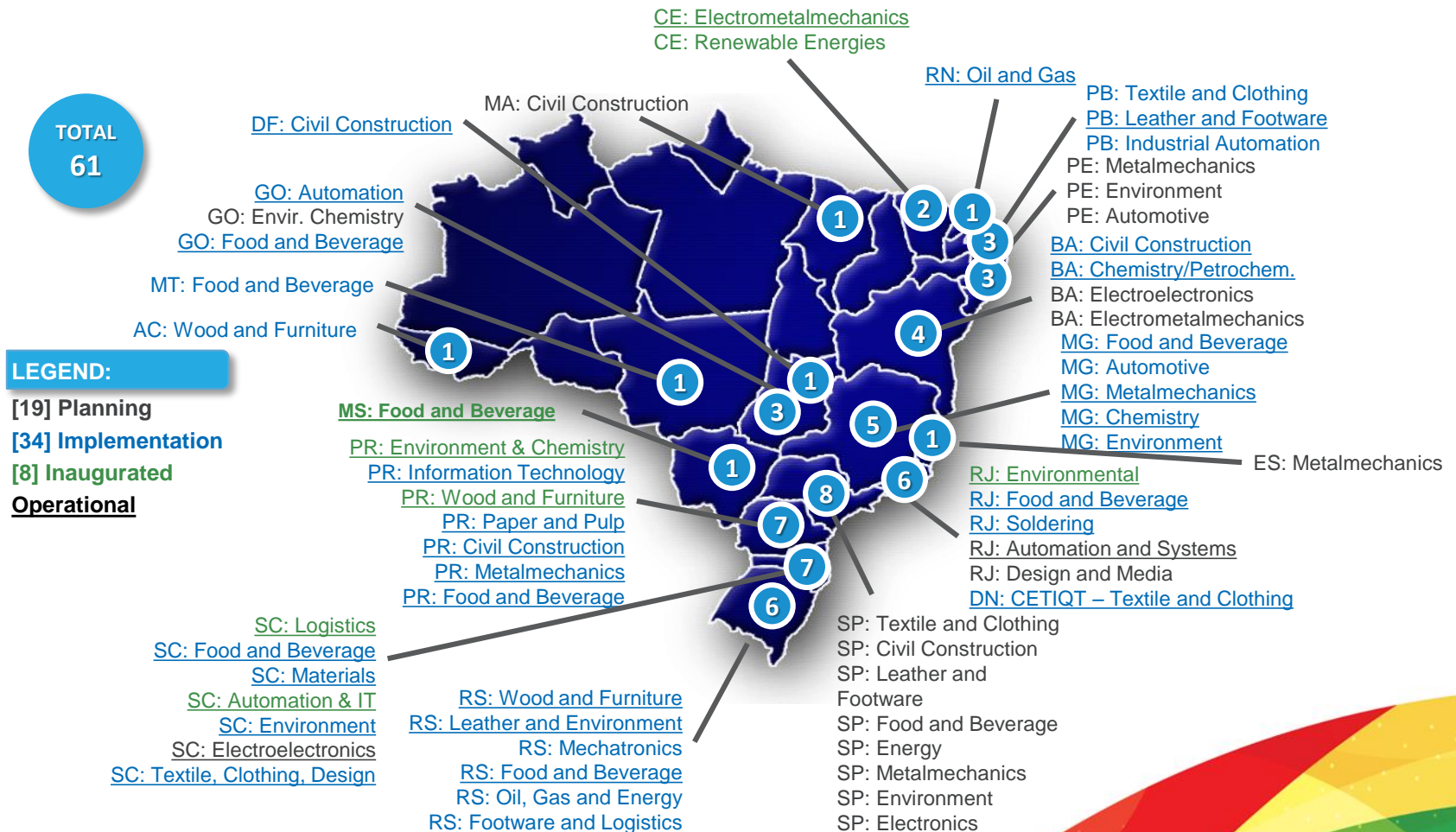
Raising the competitiveness of the **Brazilian industry**

- High quality R&D&I network:
- Access to industrial funding resources
- Access to pre-competitive funding resources:
- Preparation of qualified workers for the industry





# //> SENAI | Technical and Technological Services Technology Institutes

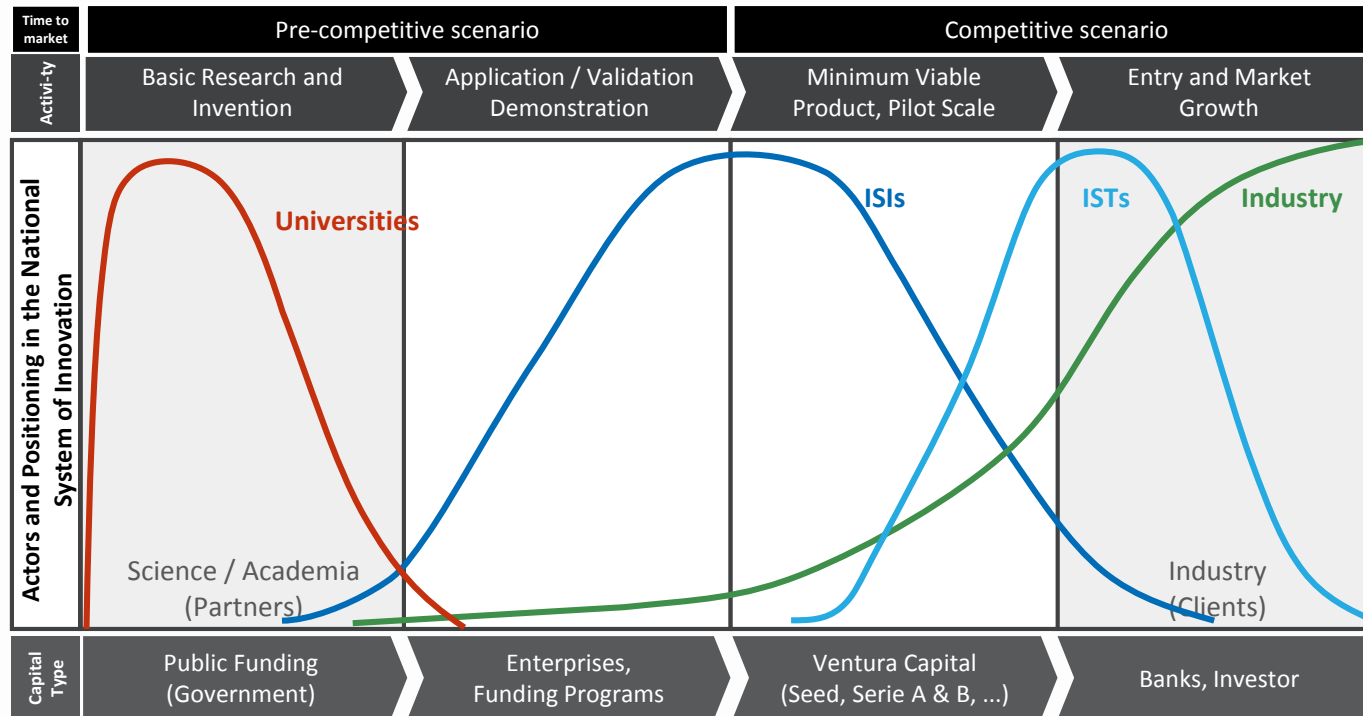


## //> SENAI | Technology Institutes

- Physical structure and staff prepared for high-end delivery of technology services:
  - . Metrology (experiments, tests, calibration, processes)
  - . Specialized technical services (e.g. prototyping)
  - . Consulting services in production processes
- Specialization in relevant industrial sectors
- Located in regions of high industrial density
- Region-wide operation scope
- Nation-wide coverage through networking

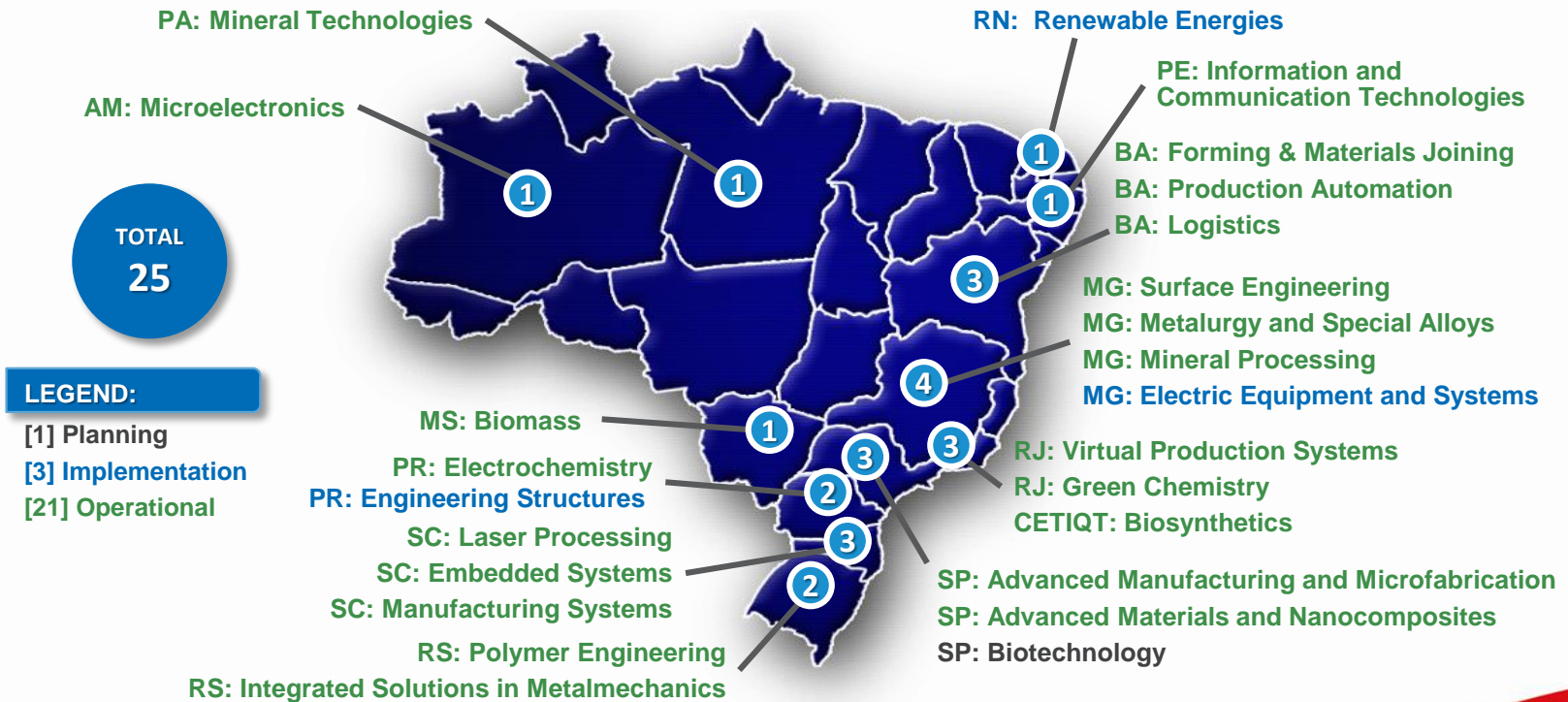
## //> SENAI | Applied Research and Innovation

Bridging research and industrial application





# //> SENAI | Applied Research and Innovation Innovation Institutes



## //> SENAI | Innovation Institutes

- Applied research and innovation:
  - . Bridge between science and industry (proactive behavior)
  - . Laboratory support for prototyping and pilot plants
  - . Knowledge and technology transfer to the business sector
- Specialization in transversal and complementary knowledge areas
- Focus on the pre-competitive development stage
- National operation scope for R&D&I services

## //> Challenges: construction of an ecosystem of innovation

Education  
know-how  
(more than 75  
years)

Legal framework  
for innovation

Scarce funding for  
technology and  
innovation in  
Brazil

Calls for projects  
in innovation

Need to foster  
innovation  
culture in  
companies

BRAZIL: a developing  
country with a  
federative  
administration model



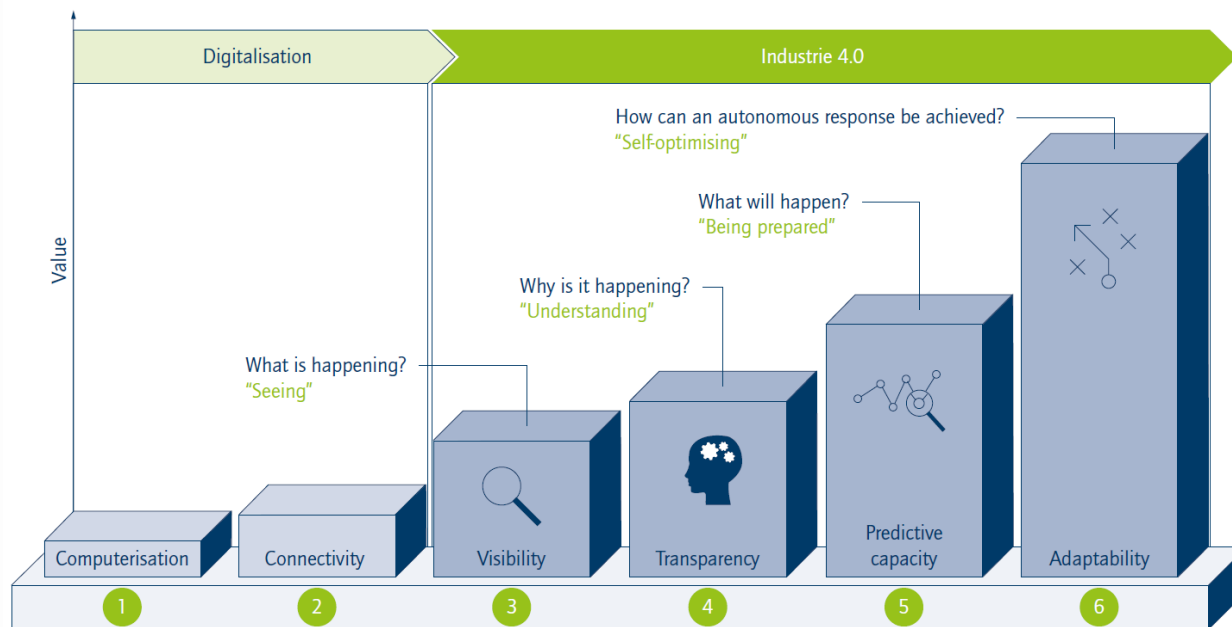
## //> SENAI | Innovation Institutes in numbers

NUMBER OF INSTITUTES IN ISI NETWORK	PROJECTS	
<b>25</b> institutes in total <b>21</b> operational <b>13</b> established <b>11</b> EMBRAPII	<b>256</b> projects	contracted and in execution <b>US\$ 100 mio.</b>
<b>STAFF</b> <b>543</b> employees  Among these: <b>181</b> hired researchers (72 MSc and 64 PhD) <b>30</b> scholarship holders (19 MSc and 13 PhD) <b>332</b> specialists, technicians and administrative staff	<b>241</b> projects	completed <b>US\$ 48 mio.</b>
	<b>497</b> projects	in portfolio* <b>US\$ 148 mio.</b>
	<b>54%</b> projects within the SENAI Network <b>24%</b> projects with other research institutions	

Source: Technology and Innovation Unit - SENAI DN – February 2017

## //> Path to Industry 4.0

“The ultimate goal is to become a learning, agile company capable of continuous, agile adaptation to a changing environment.”



Source: Acatech, 2017

## //> SENAI | Call for Projects in Innovation

Results 2012/2018 (in numbers)

**947** innovation projects  
developed in partnership  
with **827** companies

**80%**  
of projects in  
partnership with  
universities

**75%**  
of projects developed  
nationally by the  
SENAI Innovation Institutes

**US\$ 137**  
Million invested  
between 2004  
and 2017

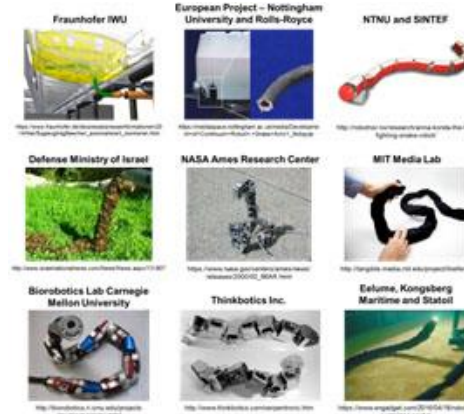
**77%**  
of projects with small  
companies and tech-  
oriented startups in  
2016



## //> Call for Projects in Innovation | SENAI-VINNOVA

Project: Airframe sealing automation using snake robot

- Company (ies):  
Saab AB and EngeMOVI.
- Partner institution(s):  
SENAI Innovation Institute for Manufacturing Systems, Aeronautics Institute of Technology (ITA) and Linköping University.
- Objective:  
Feasibility study to develop and evaluate a snake robot for the application of automated sealing of aircraft structure.



## //> SENAI | Innovation Institutes

### Project: Low Earth orbit satellites

- Interested Company(ies):  
Akaer, Visiona, Equatorial Sistemas, Optoeletrônica, Aeroeletrônica (AEL), Orbital, CENIC, Fibraforte, Compsis, Italian Companies (only for remote sensing microsats).
- Partner(s):  
SENAI Innovation Institute for Embedded Systems, ITA, Computer Sciences Dept. (ICMC/USP), Space Research National Institute (INPE), Brazilian Air Force General Staff
- Objective:  
Develop nano-/micro-satellites for remote sensing and data relay
- Estimated time for development:  
2-3 years (for each satellite)

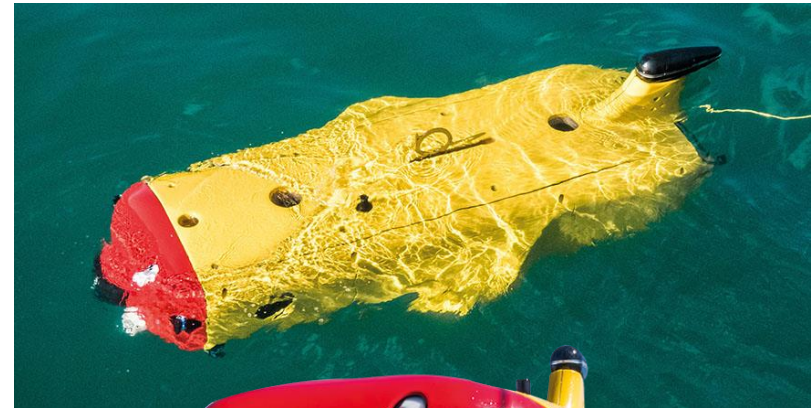




## //> SENAI | Innovation Institutes

### Project: The Flatfish

- Target industrial sector:
  - . Oil and gas companies
- Partner(s):
  - . SENAI Innovation Institute for Production Automation
- Objective:
  - . Autonomous Submarine Robot for the inspection of underwater installations in the oil and gas industrial sector
- Research area(s):
  - . Automation, robotics, microelectronics, embedded systems, computer vision, sensor technology, artificial intelligence, software engineering

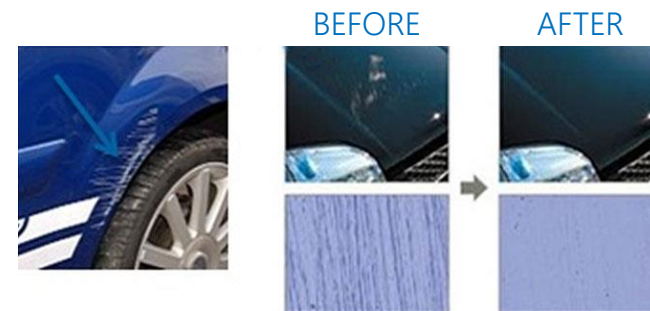
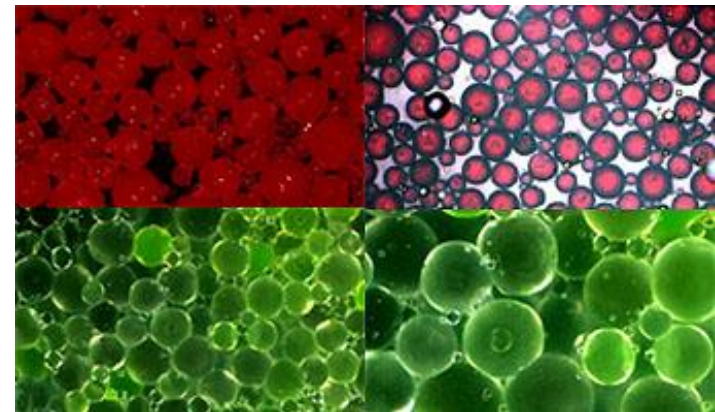




## //> SENAI | Innovation Institutes

### Project: Self-healing automotive painting

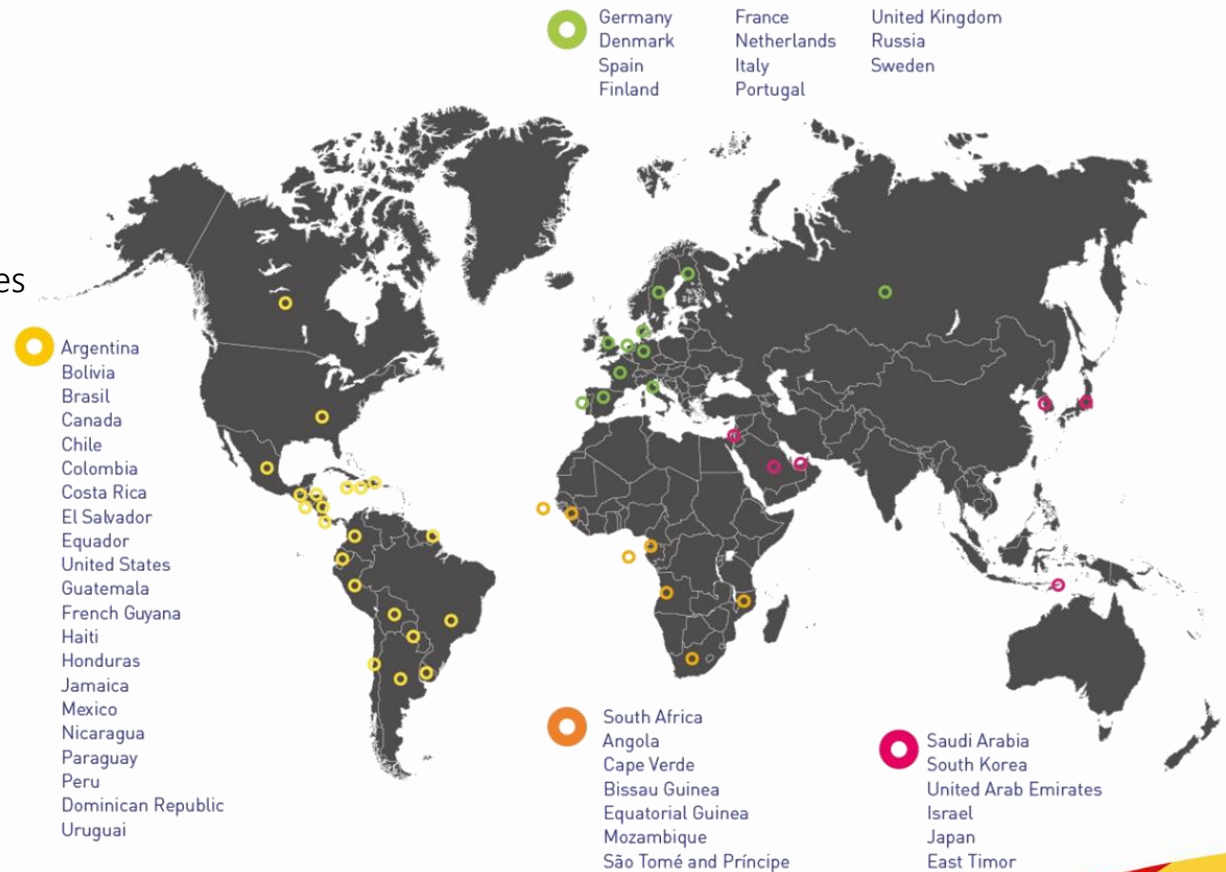
- Company Industrial Segment:
  - . Automotive
- Partner(s):
  - . UFPR, SENAI Innovation Institute for Surface Engineering and Fraunhofer IFAM
- Objectives:
  - . Development of paint with self-healing properties
- Research area(s):
  - . Painting and Corrosion
- Funding model(s):
  - . SESI SENAI Innovation Call





## //> SENAI | International Agenda

- International transfer of knowledge and cutting-edge technology to develop the Brazilian industry
- Support Brazilian industries with operations abroad
- Transfer of Brazilian technology and educational expertise to partner countries and institutions







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Thank you!

Frederico Lamego  
*International Relations - Executive Manager*  
SENAI SESI IEL  
[lamego@senaicni.org.br](mailto:lamego@senaicni.org.br)