

# **INSTITUTO SENAI** DE INOVAÇÃO



Iniciativa da CNI - Confederação  
Nacional da Indústria



**SENAI:** FUTURE

WE SET UP TODAY THE INDUSTRY OF TOMORROW.

# Creation of the National Network of SENAI Innovation Institutes

As a Structuring Activity from SENAI's Programme for Supporting the Brazilian Industry's Competitiveness

CISB 4<sup>th</sup> Annual Meeting  
São Paulo, November 11<sup>th</sup>, 2014



# Presentation Topics

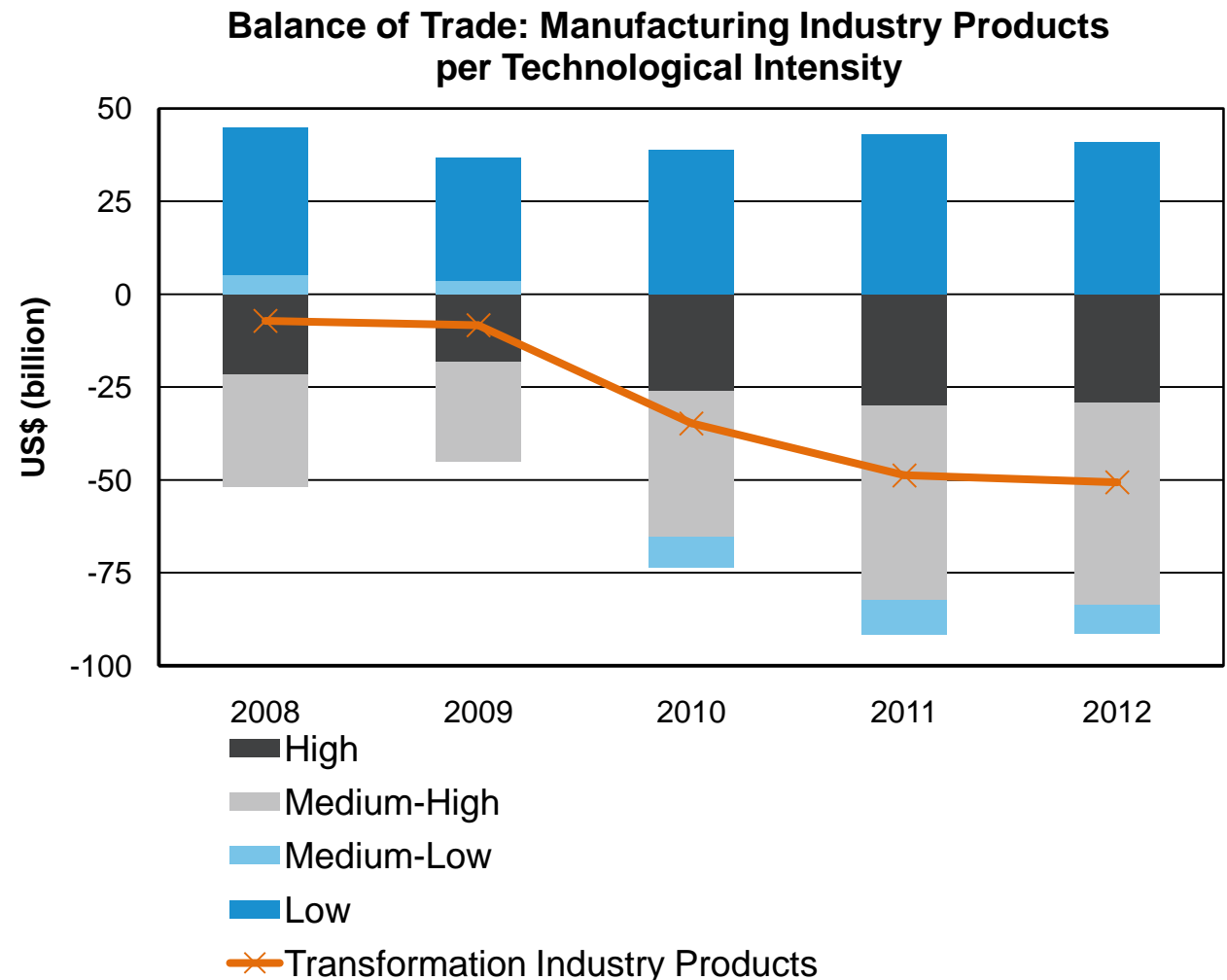
- 1 Introduction and Motivation**
- 2 SENAI Program Strategies for Supporting the Brazilian Industrial Competitiveness**
- 3 SENAI Technology Institutes**
- 4 SENAI Innovation Institutes**
- 5 Facts and Figures of the National Network of SENAI Innovation Institutes**
- 6 SENAI Structuring Actions for Funding and Supporting Innovation**
- 7 Strategic Market Segments and Services of the SENAI Innovation Institutes**

# Brazil's Balance of Trade

- Record deficit of the industrial balance of trade: US\$ 50,6 bi in 2012
- Exports:  
Iron ore, soybeans, coffee, oil, transport equipment, automotive parts, cars, machinery
- Imports:  
Equipments and consumer goods with high and medium technological added value
- Intense demand for high added-value

Source: IEDI 2012

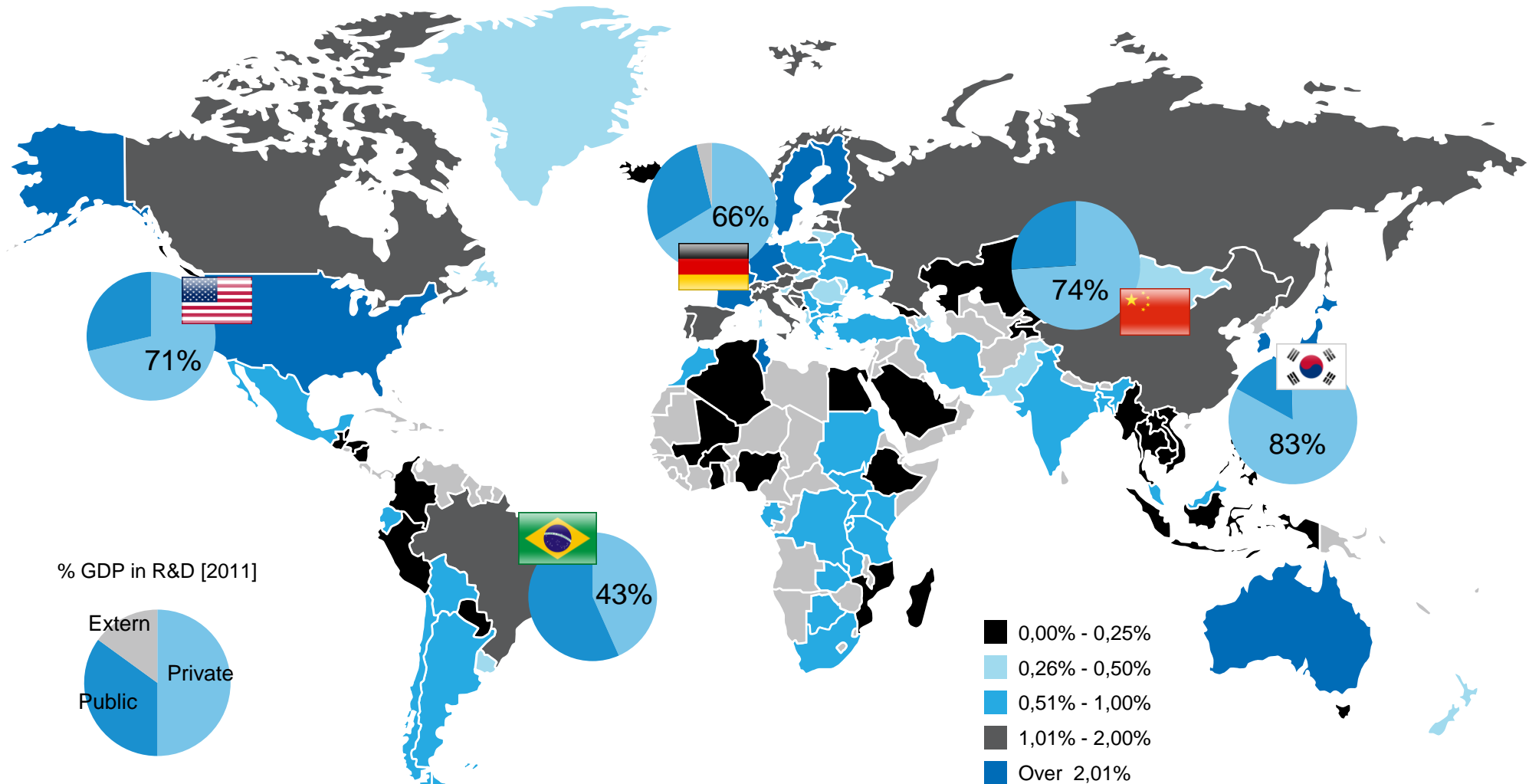
© SENAI-DN





# Investment in Research and Development [% GDP, 2011]

## Share of Private Investments in R&D



Source: Unesco; Roland Berger Strategy Consultants; Eurostat; OECD

# SENAI in Brazil

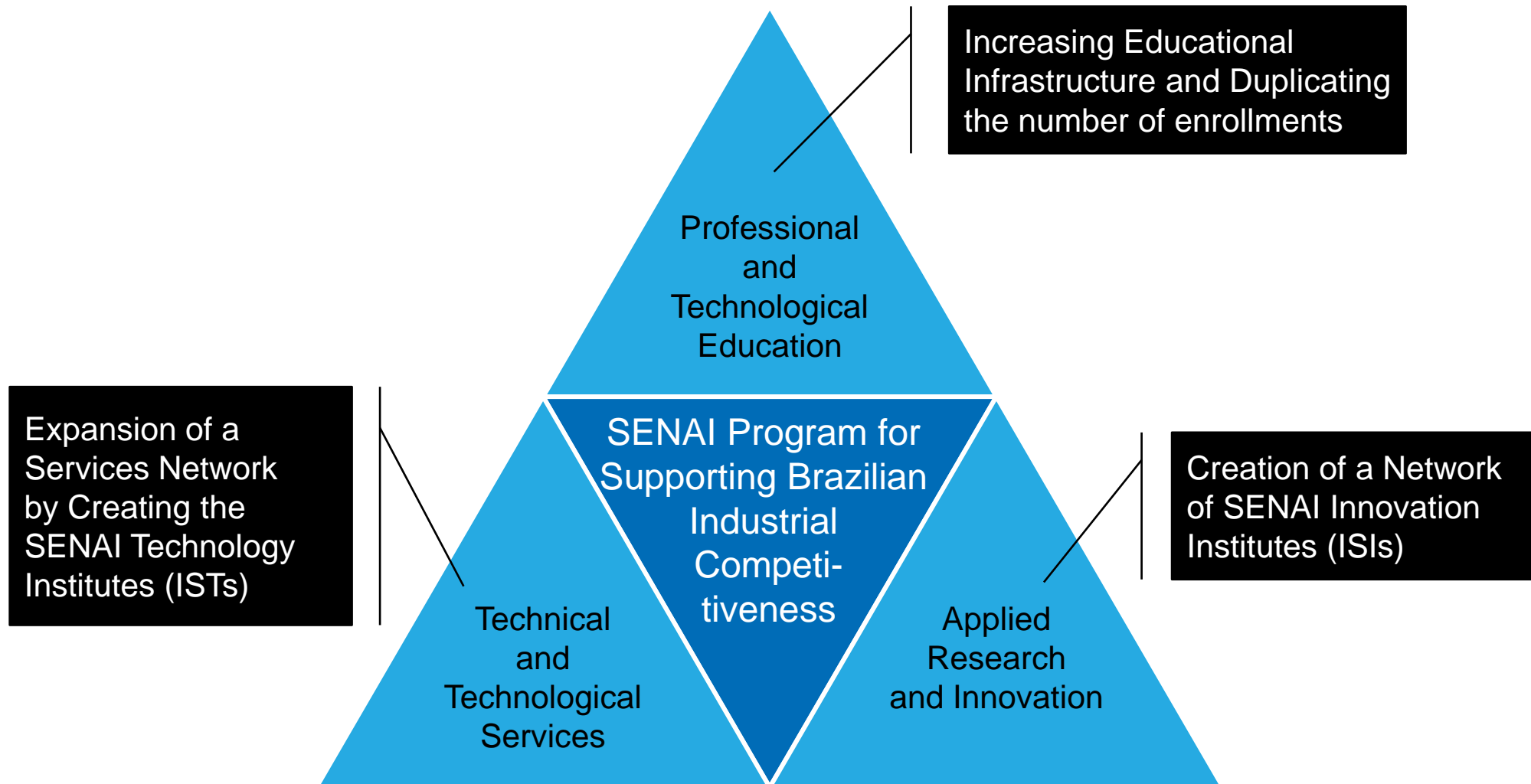
## Capacity Figures

- **Largest private network in Latin America** for technical education and technological services
- **28 industrial sectors**
- **810 operational unities**
- **4.000.000 students enrolled (2014)**



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# Fostering Innovation Capabilities of the Industry

## Technology and Innovation Areas at SENAI

SENAI Programme for Supporting  
Brazilian Industrial Competitiveness



**SENAI:** FUTURE

WE SET UP TODAY THE INDUSTRY OF TOMORROW.

SENAI  
Innovation  
Institutes

Innovation  
Management  
Processes

SENAI  
Sectorial  
Networks

SENAI  
Technology  
Institutes

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# Location and Technical Field of SENAI Technology Institutes

**TOTAL**  
**61**

**DF: Civil Construction**

**MA: Civil Construction**

**CE: Electrometalmechanics**  
**CE: Renewable Energies**

**RN: Oil and Gas**

**PB: Textile and Clothing**  
**PB: Leather and Footware**  
**PB: Industrial Automation**

**PE: Metalmechanics**  
**PE: Environment**  
**PE: Automotive**

**BA: Civil Construction**  
**BA: Chemistry/Petrochem.**  
**BA: Electroelectronics**  
**BA: Electrometalmechanics**

**MG: Food and Beverage**  
**MG: Automotive**  
**MG: Metalmechanics**  
**MG: Chemistry**  
**MG: Environment**

**ES: Metalmechanics**

**RJ: Environmental**  
**RJ: Food and Beverage**  
**RJ: Soldering**  
**RJ: Automation and Systems**  
**RJ: Design and Media**  
**DN: CETIQT – Textile and Clothing**

**SP: Textile and Clothing**  
**SP: Civil Construction**  
**SP: Leather and Footware**  
**SP: Food and Beverage**  
**SP: Energy**  
**SP: Metalmechanics**  
**SP: Environment**  
**SP: Electronics**

**RS: Wood and Furniture**  
**RS: Leather and Environment**  
**RS: Mechatronics**  
**RS: Food and Beverage**  
**RS: Oil, Gas and Energy**  
**RS: Footware and Logistics**

**MS: Food and Beverage**

**PR: Chemistry/Petrochemistry**  
**PR: Information Technology**  
**PR: Wood and Furniture**  
**PR: Paper and Pulp**  
**PR: Civil Construction**  
**PR: Metalmechanics**  
**PR: Food and Beverage**

**SC: Logistics**  
**SC: Food and Beverage**  
**SC: Materials**  
**SC: Automation & IT**  
**SC: Environment**  
**SC: Electroelectronics**  
**SC: Textile, Clothing, Design**

**MT: Food and Beverage**

**AC: Wood and Furniture**

**GO: Automation**  
**GO: Envir. Chemistry**  
**GO: Food and Beverage**

## LEGEND:

**Planning**

**Implementation**

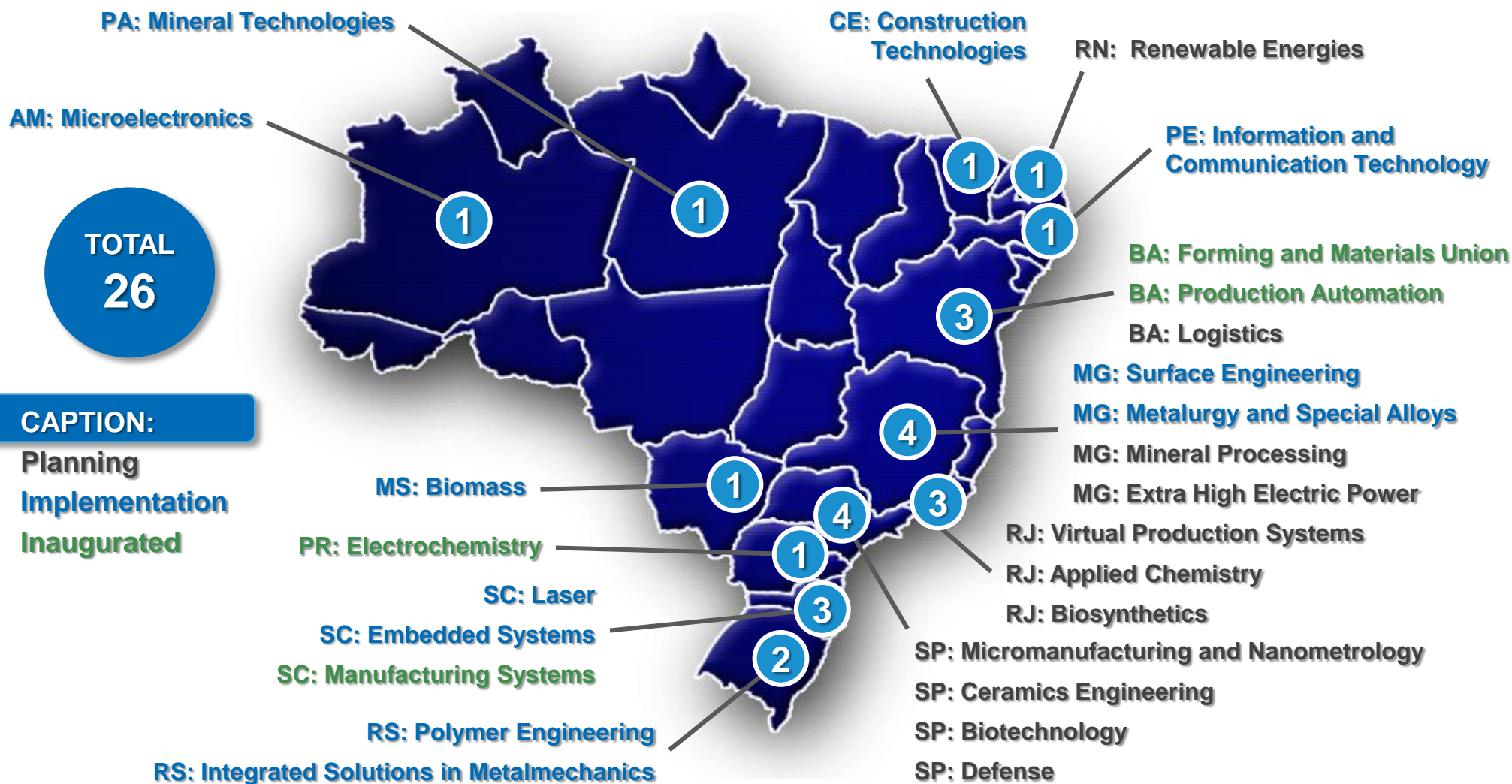
**Inaugurated**

# Presentation Topics

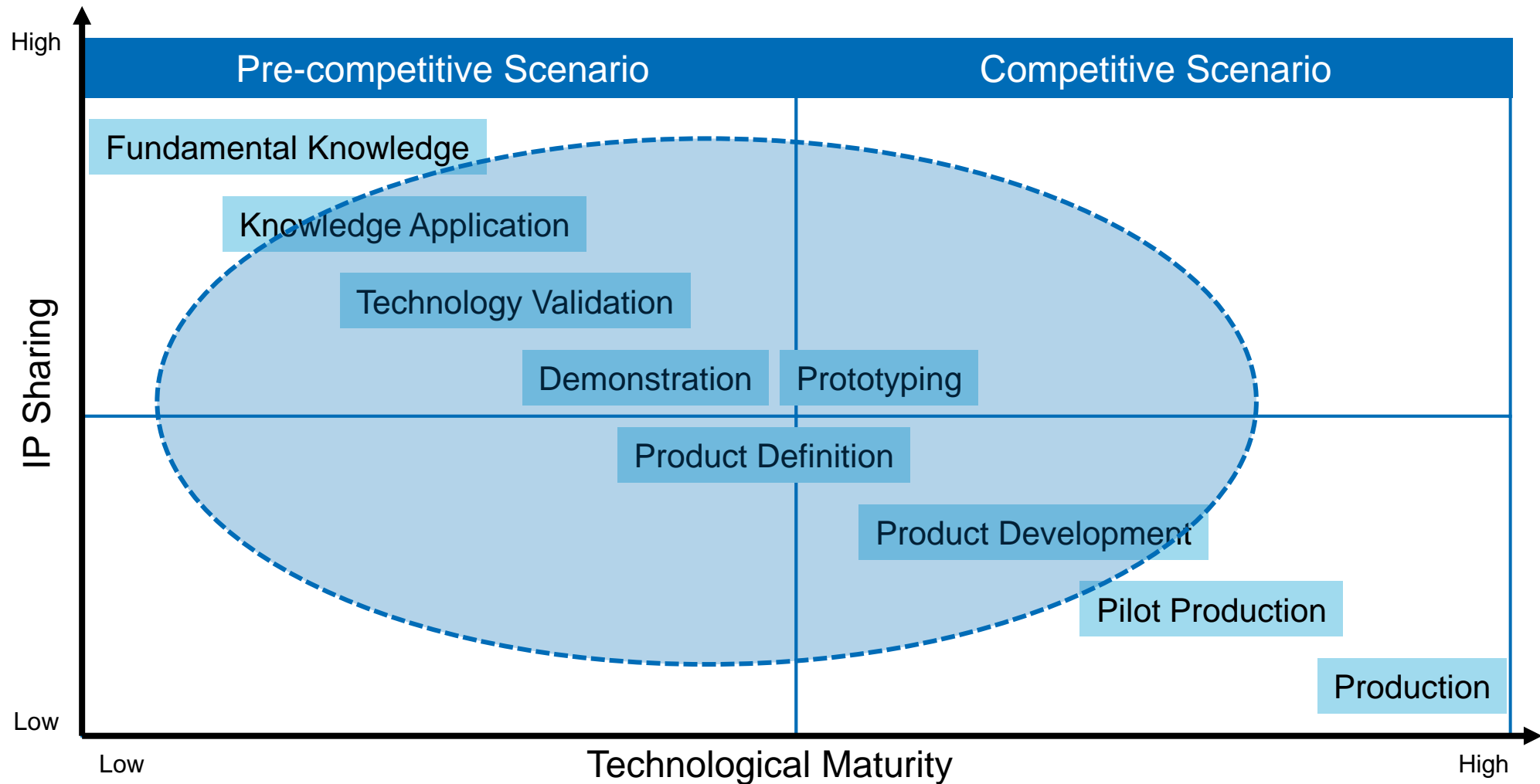
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# Location and Technical Field of SENAI Innovation Institutes



# Positioning of SENAI Institutes towards its Partners



## Sample of Specialists from Industry, Universities and Other Actors of the NIS presented and involved in the Program



# Consolidated International and National Strategic Partnerships

## ■ International Partnerships



**Massachusetts  
Institute of  
Technology**

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# General Facts and Figures of the SENAI Innovation Institutes

## Operational ISIs (R\$ 70+ mi in Contracted Projects)

**INSTITUTO SENAI**  
DE INOVAÇÃO MICROELETRÔNICA

**INSTITUTO SENAI**  
DE INOVAÇÃO AUTOMAÇÃO

**INSTITUTO SENAI**  
DE INOVAÇÃO ENGENHARIA DE SUPERFÍCIES

**INSTITUTO SENAI**  
DE INOVAÇÃO METALURGIA

**INSTITUTO SENAI**  
DE INOVAÇÃO BIOMASSA

**INSTITUTO SENAI**  
DE INOVAÇÃO TECNOLOGIA DA INFORMAÇÃO

**INSTITUTO SENAI**  
DE INOVAÇÃO ELETROQUÍMICA

**INSTITUTO SENAI**  
DE INOVAÇÃO ENGENHARIA DE POLÍMEROS

**INSTITUTO SENAI**  
DE INOVAÇÃO METALMECÂNICA

**INSTITUTO SENAI**  
DE INOVAÇÃO SISTEMAS DE MANUFATURA

**INSTITUTO SENAI**  
DE INOVAÇÃO LASER

**INSTITUTO SENAI**  
DE INOVAÇÃO SISTEMAS EMBARCADOS

- **SENAI-AM**
  - Microelectronics [2 projects] (R\$ 550.000,00)
- **SENAI-BA**
  - Production Automation [7 projects] (R\$ 35.167.000,00)
- **SENAI-MG**
  - Surface Engineering [2 projects] (R\$ 1.481.435,00)
  - Metallurgy and Special Alloys [3 projects] (R\$ 2.197.543,28)
- **SENAI-MS**
  - Biomass [3 projects] (R\$ 3.303.020,00)
- **SENAI-PE**
  - Information and Communication Technology [4 projects] (R\$ 611.000,00)
- **SENAI-PR**
  - Electrochemistry [5 projects] (R\$ 3.080.425,00)
- **SENAI-RS**
  - Polymer Engineering [19 projects] (R\$ 14.027.528,90)
  - Int. Solutions in Metalmechanics [3 projects] (R\$ 3.070.400,00)
- **SENAI-SC**
  - Manufacturing Systems [7 projects] (R\$ 5.828.544,00)
  - Laser [4 projects] (R\$ 1.665.299,00)
  - Embedded Systems [2 projects] (R\$ 936.270,00)

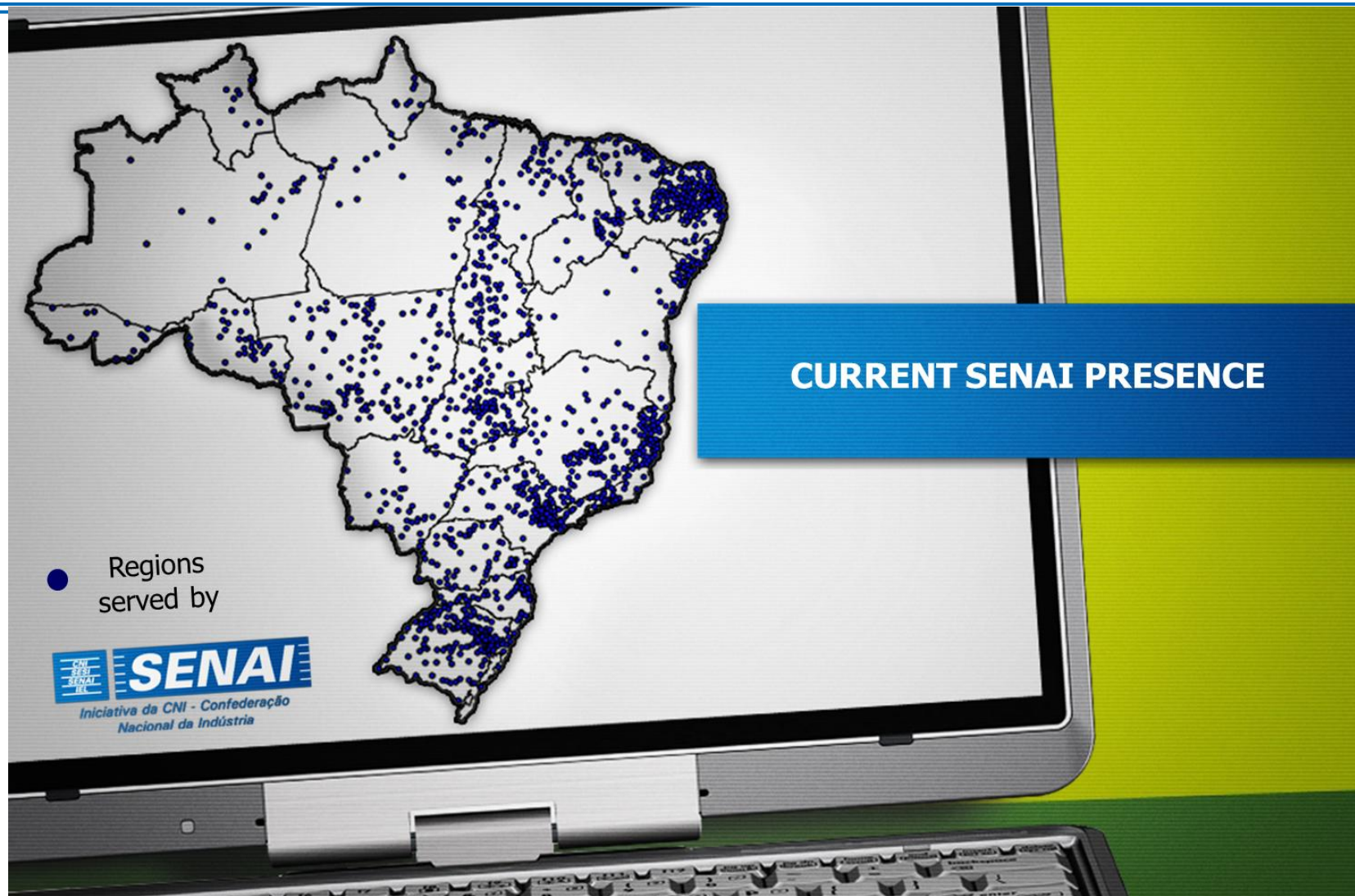
**TOTAL:** [61 projects] (R\$ 71.918.465,18)



# Presentation Topics

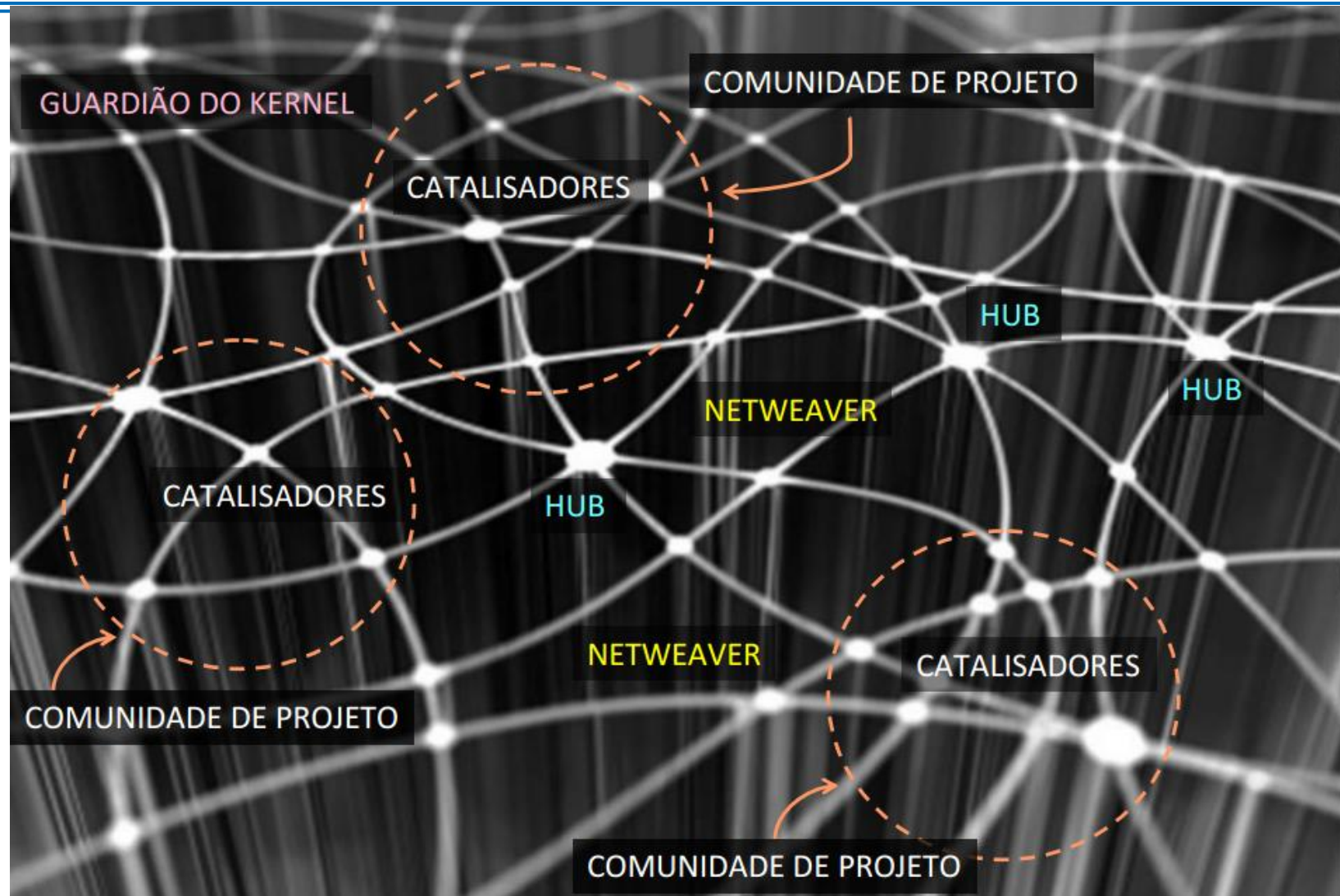
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# Our Challenge – how to move from this picture...

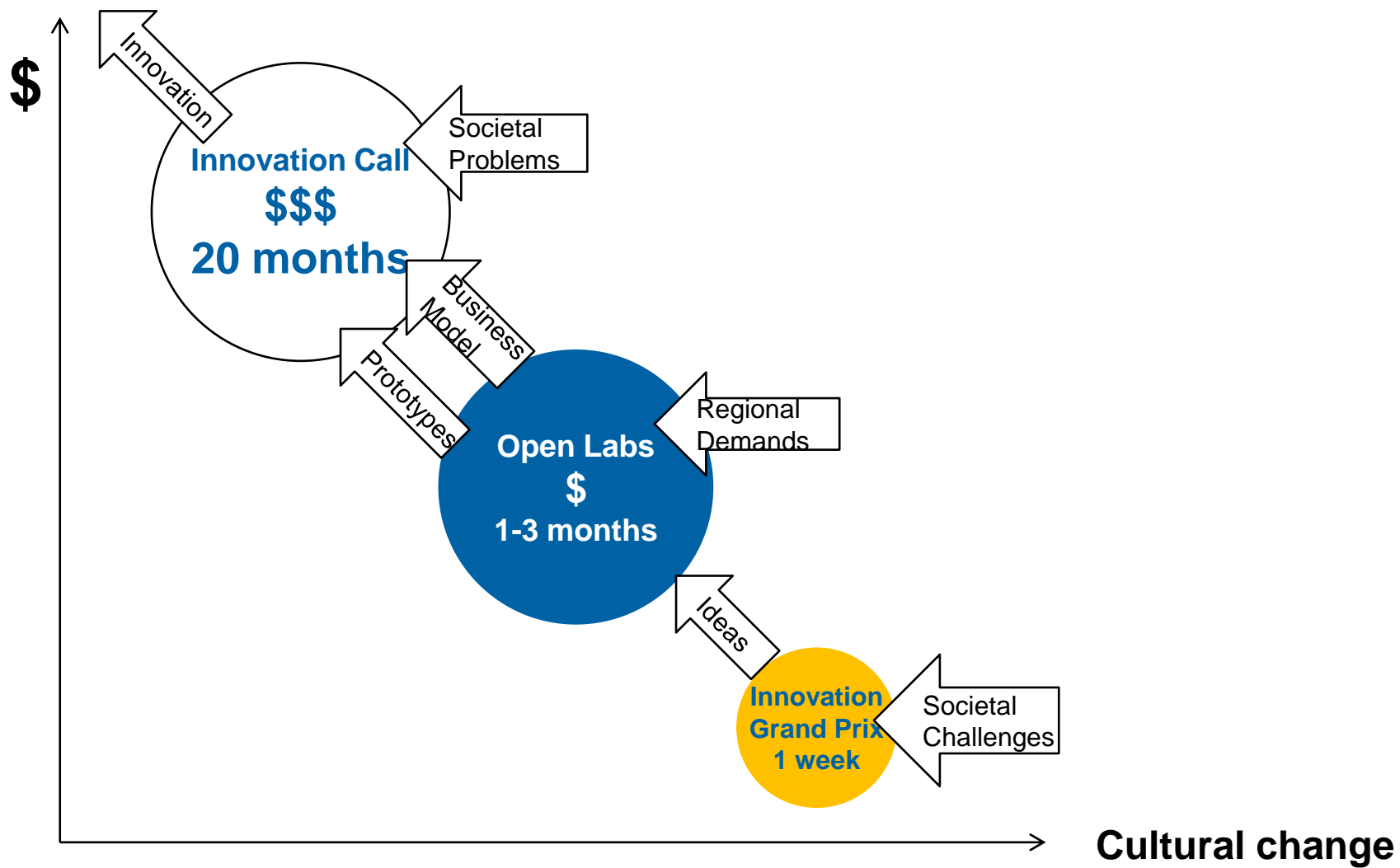




## ... into a innovation network community



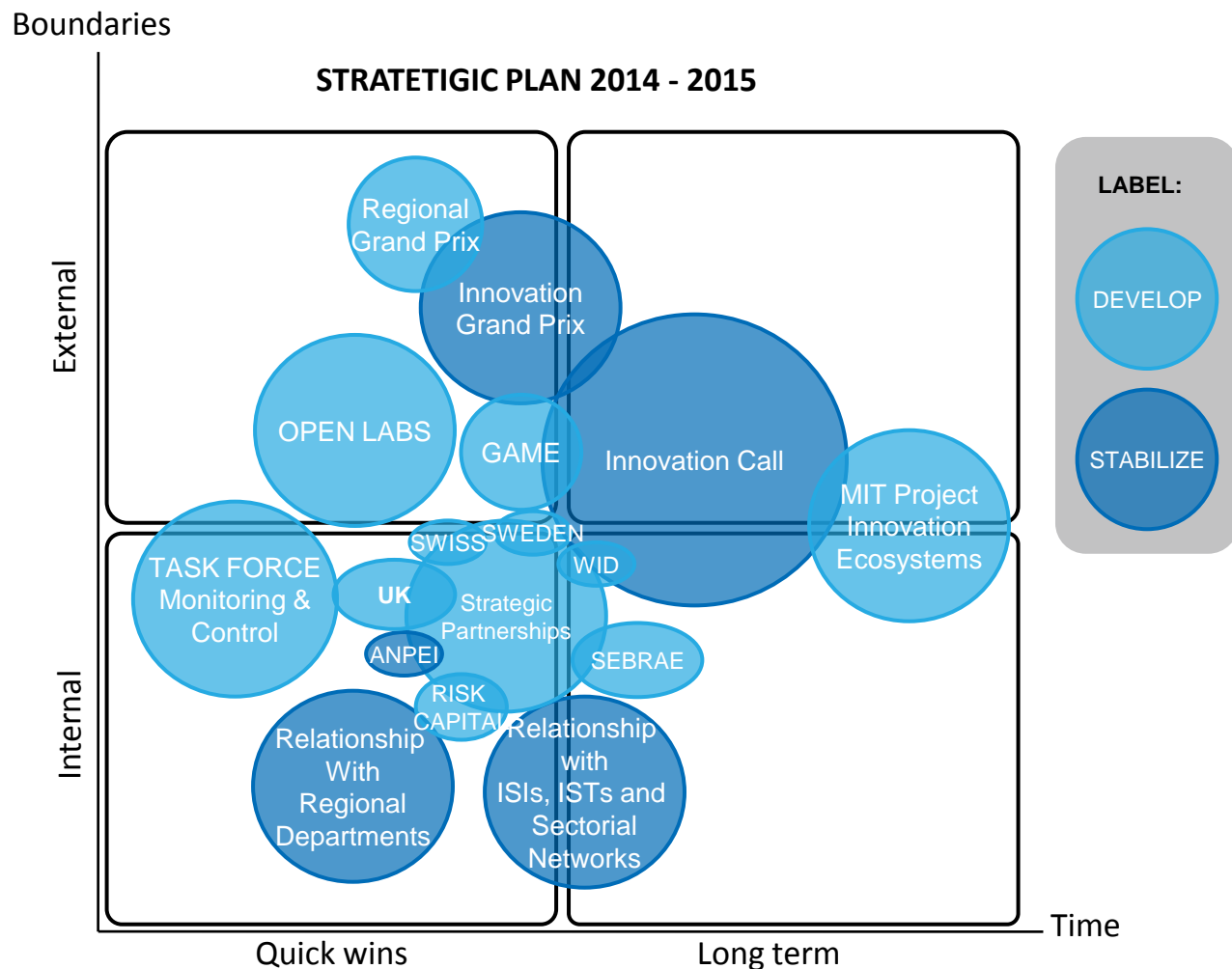
# These are (so far) our tools



# Action Plan for Supporting Innovation Innovation Management Processes

## Main Current Structuring Actions

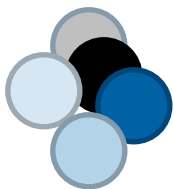
- SENAI SESI Innovation Call
- SENAI Innovation Grand Prix
- SENAI Open Laboratory
- SENAI-MIT Cooperation Project
- SENAI Innovation and Entrepreneurship Week



# SENAI SESI Innovation Call

## R\$ 30,5 Mi per Year for Funding Innovation Projects

**Thematic & Continuous Call**

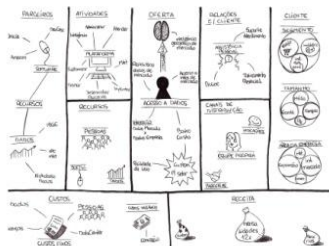


*Challenges from Industry and Society*

**Submission of Ideas**



Business Model Canvas - Geofusion: OnMaps



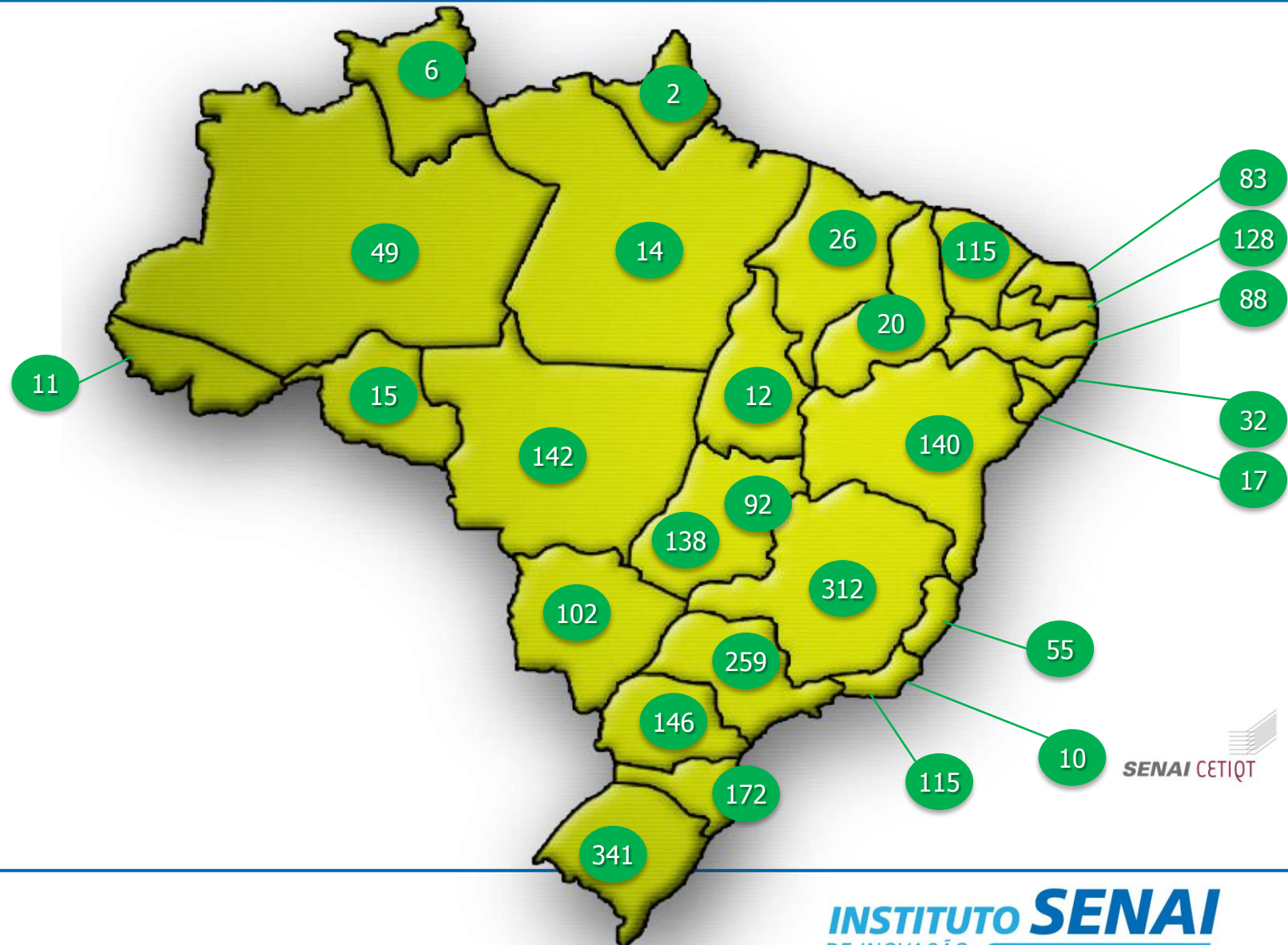
**Submission of Project Plans**

**Qualification**  
based on the  
Innovation Impact

**Final Evaluation**  
based on the Project Plan

**Web platform for collaboration mentoring**

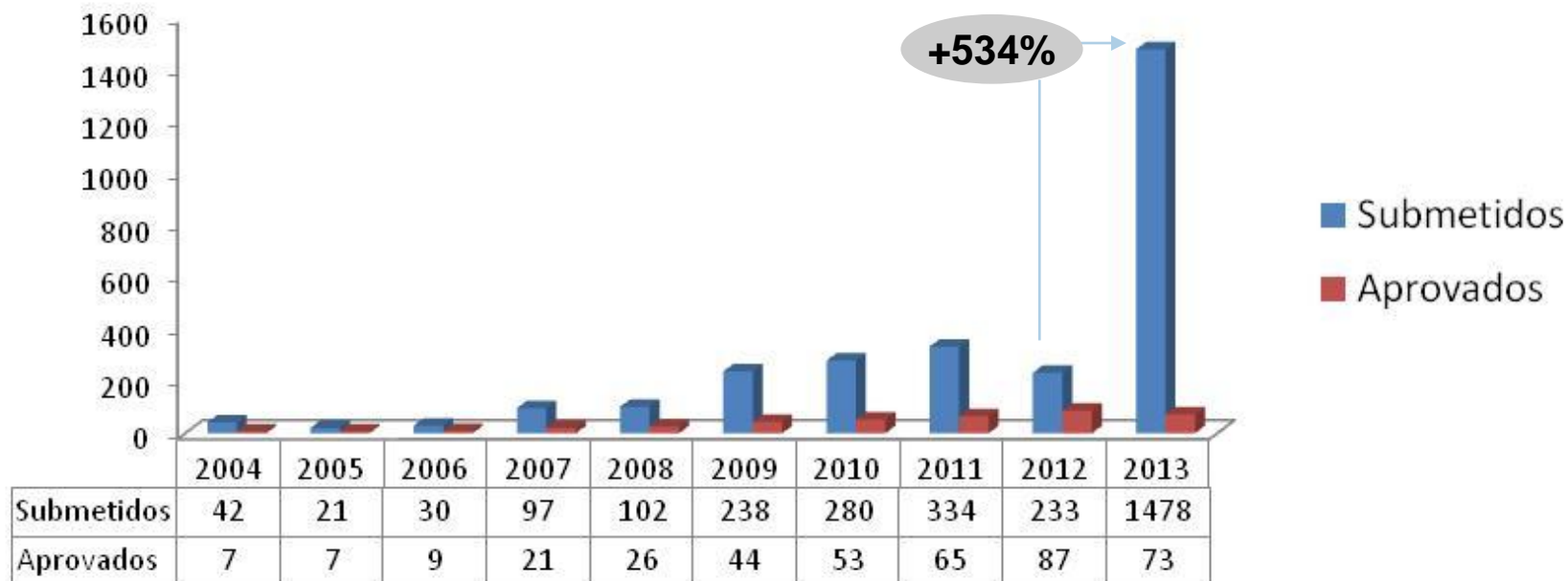
# Submitted Proposals – since 2004 until 2013 (TOTAL: 2.776)





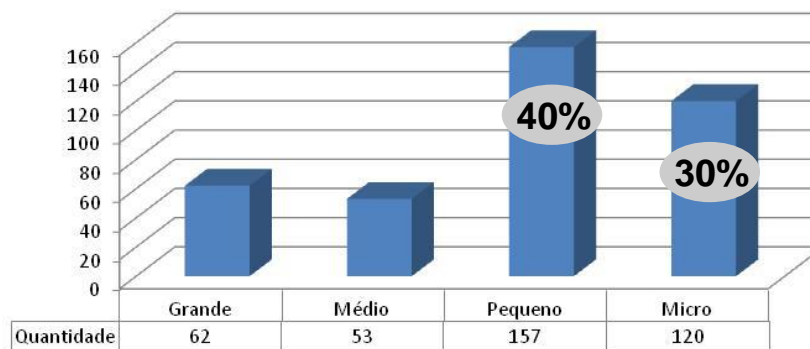
# Innovation Call – Ideas & projects history

## Histórico do DN - Submetidos SENAI/SESI



**392  
Companies**

## Projetos Aprovados SENAI x Porte da Empresa









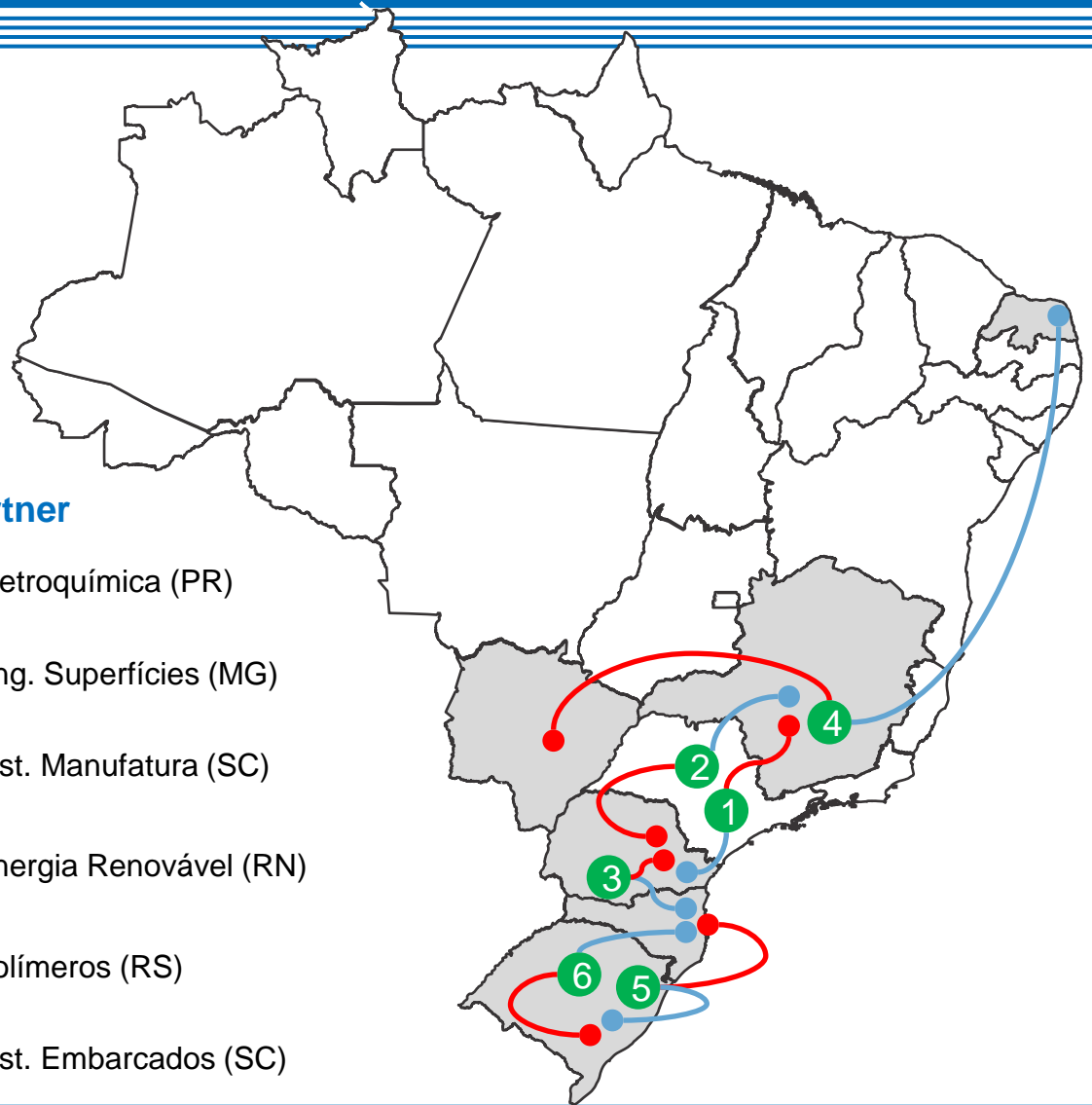


# 2014 Edition 2014 - 2014.1 Cycle

## Results – ISIs Innovation Network

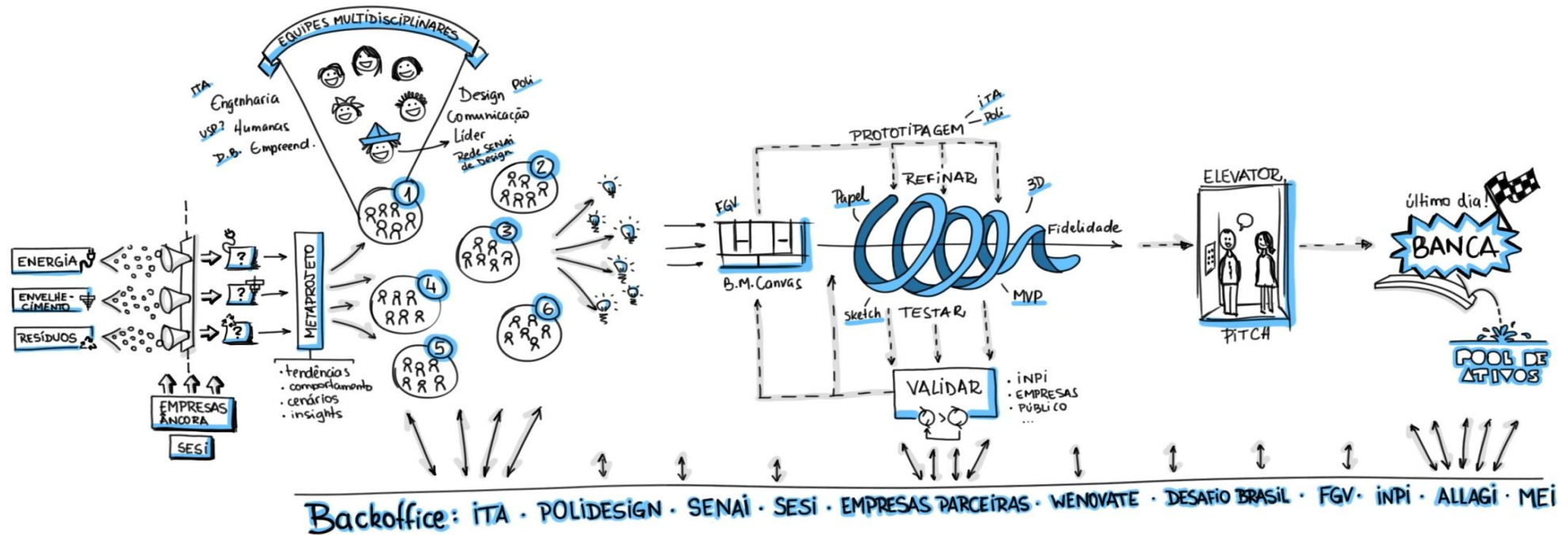
**6 projects (33%)**

	Company	Proponent	Partner
1	GM do Brasil (SP)	ISI Eng. Superfícies (MG)	ISI Eletroquímica (PR)
2	GM do Brasil (SP)	ISI Eletroquímica (PR)	ISI Eng. Superfícies (MG)
3	M LUDEKE (PR)	ISI Eletroquímica (PR)	ISI Sist. Manufatura (SC)
4	Lactoquímica (MG)	ISI Biomassa (MS)	ISI Energia Renovável (RN)
5	Upsensor (RS)	ISI Sist. Embarcados (SC)	ISI Polímeros (RS)
6	Upsensor (RS)	ISI Polímeros (RS)	ISI Sist. Embarcados (SC)



# SENAI Innovation Grand Prix

## Methodology and Results in the First Semester of 2014



3

Challenges

6

Teams

7

Industrial  
Partners

8

Support  
Organizations

72

Hours

289

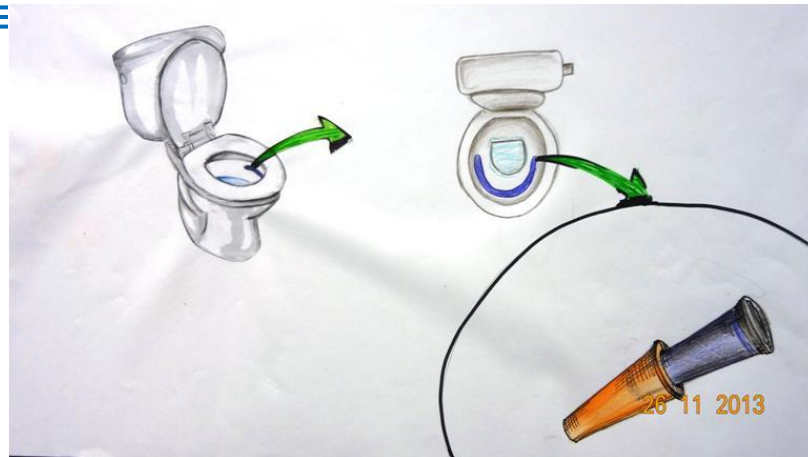
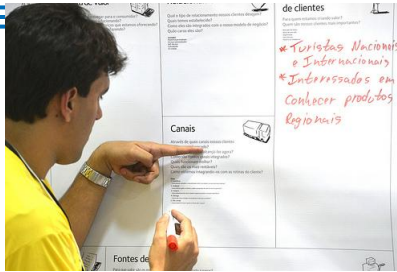
Ideas

# Partnerships

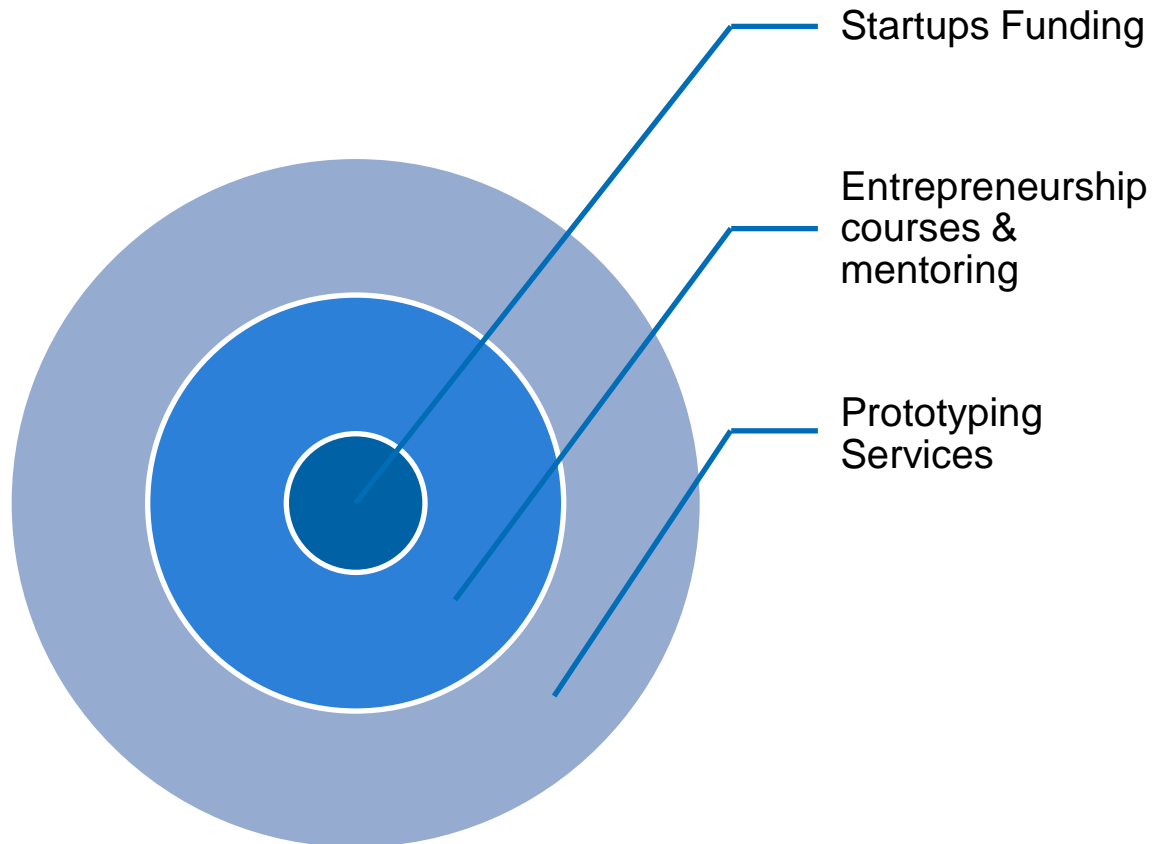




# Culture change



# SENAI Open Labs – Prototyping & Entrepreneurship





# SENAI Open Labs – Prototyping & Entrepreneurship

## Existing labs...



... open to anybody with a great idea and the will to inovate ...



... to prototype new business and conect them to the industry.



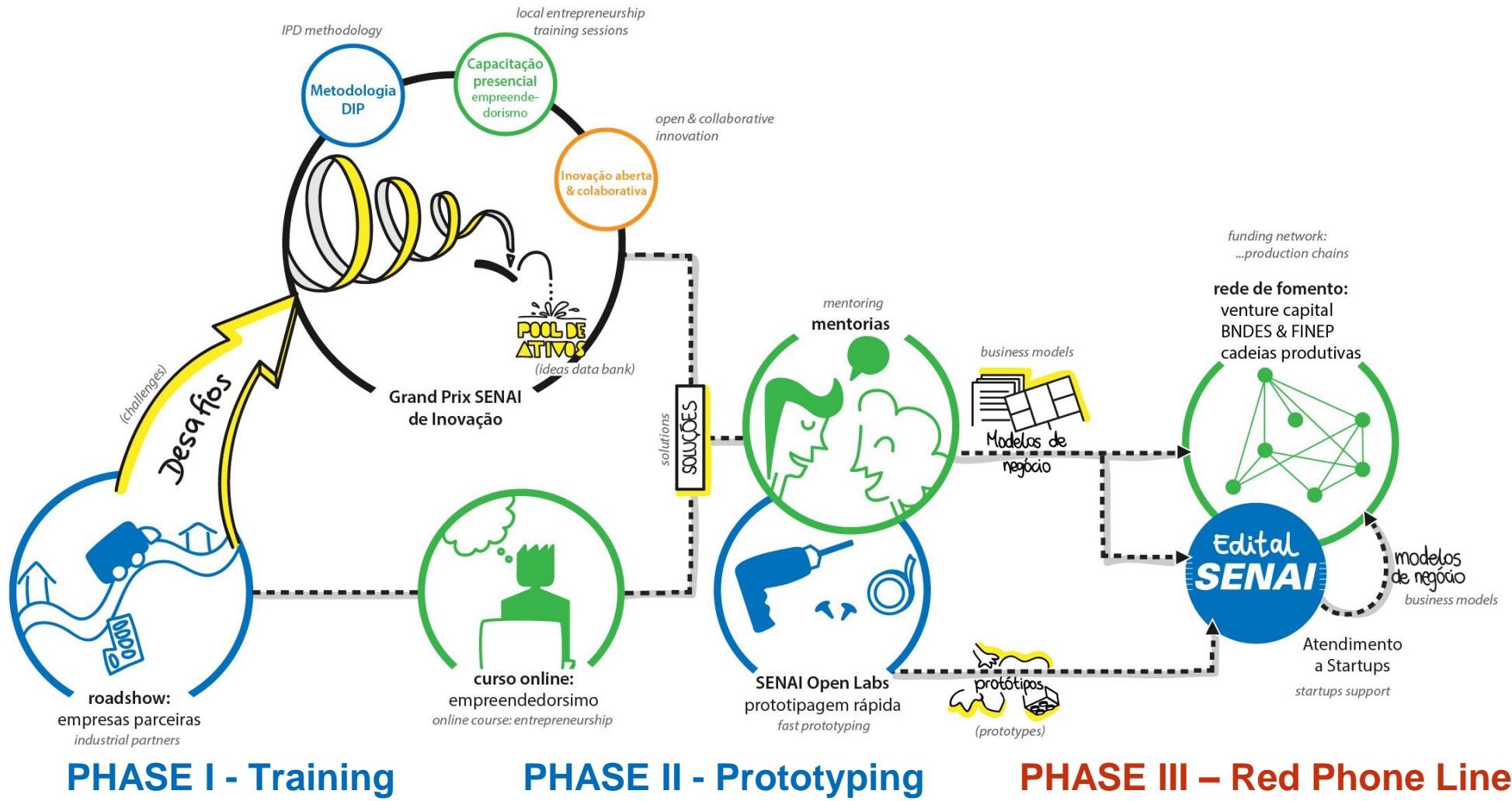
# SENAI Open Labs - Location



## Partnerships



# SENAI Open Labs Methodology



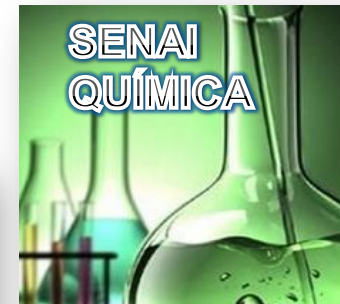


# SENAI Thematic Networks

## Collaboration among Schools, Technology & Innovation Institutes



# 10 THEMATIC NETWORKS



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## *Microelectronics in systems and products, sensors and packaging*



### ■ ISI Strategic Markets Segments:

- Producers of Microelectr. Devices and Intelligent Systems, Contract Manufacturing, Health, Oil & Gas & Energy, Consumer Goods.

### ■ Service Portfolio / Technology Platforms:

- Tests, Characterization and Failure Analysis;
- Development of Devices and Components;
  - Microelectronic Bio-Sensors and Systems;
- Optimization and Control of Productive Processes;
- Industrial Process Monitoring;
- Solutions for Intelligent Systems and Packaging;
- Consulting and Training in Microelectronics.

### ■ Infrastructure and Team:

- Building under construction: 2.880m<sup>2</sup> (430m<sup>2</sup> Clean Room ISO7).
- Current staff: 3 researchers and specialists.
- Planned staff: 23 researchers and specialists.

Investments >> DR: R\$ 590.000,00 | BNDES: R\$ 33.500.000,00 | **TOTAL: R\$ 34.090.000,00**

Inauguration of the Institute Estimated for: August/2015

Location of the Institute: Complexo SENAI Zona Leste Manaus



*Innovation in mechatronic design, product and process prototyping*



## ■ ISI Strategic Markets Segments:

- Oil & Gas, Mobility, Energy, Healthcare, Electronics, Mining.

## ■ Service Portfolio / Technology Platforms:

- Systems Integration;
- Robotics and Automation;
- Sensors and Microelectronics;
- Control Systems and Software;
- Quality Assurance and Measurement Systems;
- Mechatronic Systems.

## ■ Infrastructure and Team:

- Laboratory area: 612m<sup>2</sup>.
- Current staff: 28 researchers (3 Doctors, 4 Masters).

Investments >> DR: R\$ 2.440.000,00 | BNDES: R\$ 15.500.000,00 | **TOTAL: R\$ 17.940.000,00**

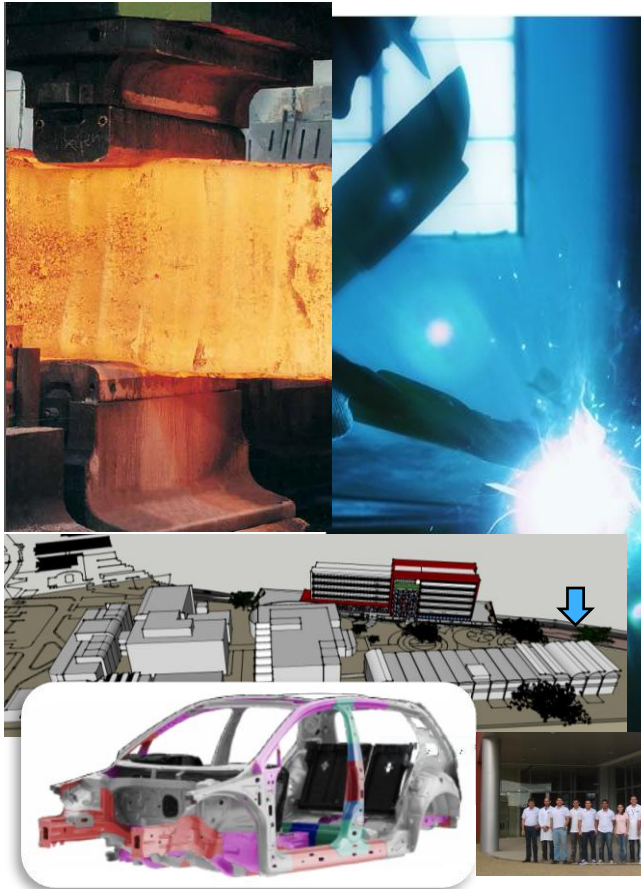
Inauguration of the Institute: March/2014

Location of the Institute: Campus SENAI Cimatec





*Innovative solutions for the production chain in forming and joining of materials*



## ■ ISI Strategic Markets Segments:

- Oil & Gas, Metallurgy, Automotive, Chemical & Petrochemical and Metalworking.

## ■ Service Portfolio / Technology Platforms:

- Integrated Solutions;
- Materials;
- Forming Processes and Joining of Materials;
- Design and Simulation;
- Quality Assurance.

## ■ Infrastructure and Team:

- New Building with 7,912m<sup>2</sup>.
- Main Forming Equipments already installed and integrated with other SENAI CIMATEC materials laboratories.
- 20 Trainee Engineers qualified on a Specialization Program at SENAI CIMATEC.
  - 6 of them have already started technical trainings abroad.

Investments >> DR: R\$ 3.440.000,00 | BNDES: R\$ 16.500.000,00 | **TOTAL: R\$ 19.940.000,00**

Inauguration of the Institute: March/2014

Location of the Institute: Campus SENAI Cimatec

## *Innovation in Projects, Logistic Operations and Supply Chain Management*



### ■ ISI Strategic Markets Segments:

- Oil & Gas, Chemistry and Petrochemistry, Energy, Electroelectronics, Mining, Metalmechanics, Agrobusiness, Food & Beverage, Communication.

### ■ Service Portfolio / Technology Platforms:

- Supply Chain Management;
- Modelling & Simulation of Complex Systems;
- Lean Logistics;
- Green Logistics;
- Advanced IT-supported Logistic Systems.

### ■ Infrastructure and Team:

- ISI Building with 1.760m<sup>2</sup>.
- Current staff: 13 researchers and specialists.
- Planned staff: 23 researchers and specialists.

Investments >> DR: R\$ 20.000.000,00 | BNDES: R\$ 2.000.000,00 | **TOTAL: R\$ 22.000.000,00**

Inauguration of the Institute Estimated for: Month/Year

Location of the Institute: Campus SENAI Cimatec

*Materials and components, constructive processes, intelligent buildings*



## ■ ISI Strategic Markets Segments:

- Commercial and residential building constructions, heavy civil construction (roadways, railways), industrial construction, building installations.

## ■ Service Portfolio / Technology Platforms:

- New materials and technologies applied to the construction;
- Development and optimization of construction processes;
- Sustainable (Green) and Smart Buildings;
- Construction planning, design and management.

## ■ Infrastructure and Team:

- Smart building and lab areas under construction: 1650 m<sup>2</sup>.
- Current staff: 2 (Director and Market Agent);
- Planned staff: 20 researchers and specialists.

Investments >> DR: R\$ 7.072.193,00 | BNDES: R\$ 39.271.810,00 | **TOTAL: R\$ 46.344.003,00**

Inauguration of the Institute Estimated for: Month/Year

Location of the Institute: Maracanaú/CE



*Solutions in chemical biosynthesis for the production of sustainable products and processes*



## ■ ISI Strategic Markets Segments:

- Chemical-based industry, biofuels, agrochemistry, consumer goods industry, *home & personal care*, pulp & paper, oil & gas.

## ■ Service Portfolio / Technology Platforms:

- Proof of concept in synthetic biology;
- Development of new chemical and biochemical derivatives from oil and renewable raw material;
- Analytical Chemistry and Catalysis;
- Scale up of chemical and bio processes;
- Advanced strategies for process controlling.

## ■ Infrastructure and Team:

- New building in planning phase with an area of 3000 m<sup>2</sup>.
- Planned Team: 50 employees, including researchers, specialists and administrative support, to be hired in 2015.

Estimated Investments >> **TOTAL: R\$ 60.000.000,00**

Inauguration of the Institute Estimated for: Month/Year

Location of the Institute: Parque Tecnológico da Ilha do Fundão - RJ





## *Surface Technology, Coatings, Plasma*



### ■ ISI Strategic Markets Segments:

- Energy, Oil & Gas, Metallurgy, Machining Tools, Mining, Automotive and Glasses.

### ■ Service Portfolio / Technology Platforms:

- Consulting on Surface Technologies (focusing surface characterization, tribology and glasses);
- Corrosion and wear resistance solutions;
- Development of surfaces and coatings;
- Characterization and evaluation of surface performance;
- Production process optimization related to surfaces;
- Solutions for surfaces and coatings.

### ■ Infrastructure and Team:

- Building under construction: 1.600m<sup>2</sup>.
- Current staff: 11 researchers and specialists.

Investments >> DR: R\$ 4.387.217,90 | BNDES: R\$ 31.159.961,10 | **TOTAL: R\$ 35.547.179,00**

Inauguration of the Institute Estimated for: Month/Year

Location of the Institute: Centro de Inovação e Tecnologia SENAI FIEMG

*Innovative solutions in metallurgical products and processes*



## ■ ISI Strategic Markets Segments:

- Oil & Gas, Metallurgy of Steels, Non ferrous alloy producers, Foundry, Automotive, Aeronautics, Metal-mechanics.

## ■ Service Portfolio / Technology Platforms:

- Analysis and characterization of alloys;
- Development and optimization of alloys;
- Development and optimization of processes;
- Development and optimization of products.

## ■ Infrastructure and Team:

- Existing building under renovation: 1.525m<sup>2</sup>.
- New Building under construction 1.038m<sup>2</sup>.
- Current staff: 13 researchers and specialists.
- Planned staff: 32 researchers and specialists.

Investments >> DR: R\$ 4.612.003,00 | BNDES: R\$ 26.556.185,24 | **TOTAL: R\$ 31.168.188,24**

Inauguration of the Institute Estimated for: July/2016 (October/2015)

Location of the Institute: Centro de Inovação e Tecnologia SENAI FIEMG

## *Research development and innovative solutions in mineral processing*



### ■ ISI Strategic Markets Segments:

- Producers of iron ore, niobium, phosphate, zinc, copper and gold.

### ■ Service Portfolio / Technology Platforms:

- Mineral Characterization;
- Laboratory and Test Pilot Plant in mineral processing;
- Exploration of lower grade raw material sources;
- Development of new products and export of mineral technology;
- Solution: Recovery tailing ponds;
- Solution: Process efficiency and productivity increasing (exploration, water, energy).

### ■ Infraestructure and Team:

- Renovating the existing building: 2.350 m<sup>2</sup>.
- Current staff: 12 researchers and 10 operational assistants.

Investments >> DR: R\$ 7.710.579,94 | **TOTAL: R\$ 7.710.579,94**

Inauguration of the Institute Estimated for: Month/Year

Location of the Institute: Centro de Inovação e Tecnologia SENAI FIEMG

## *Energy engineering and network technology*



### ■ ISI Strategic Markets Segments:

- Electrical Utilities, Electric-electronic, Oil & Gas, Telecommunication.

### ■ Service Portfolio / Technology Platforms:

- High Power Laboratory up to 2500 MVA;
- High Voltage Laboratory up to 550 kV;
- Temperature Rise up to 25 kA current;
- Protection Degree and Explosive Atmospheres;
- Surge Arrester Laboratory;
- Electromagnetic Compatibility Laboratory;
- Insulation Oil, Mechanical Endurance and Calibration Laboratories.

### ■ Infraestructure and Team:

- Total Construction Area: 75.000 m<sup>2</sup> (under construction).
- 1st Construction Stage (Planned): 22 researchers and specialists.
- 2nd Construction Stage (Planned): 58 researchers and specialists.

Investments >> DR: R\$ 226.130.501,60 | BNDES: R\$ 76.085.469,60 | **TOTAL: R\$ 302.215.971,20**

Inauguration of the Institute Estimated for: Month/Year

Location of the Institute: Centro de Desenvolvimento e Inovação da Indústria Eletro-eletrônica



## *Biomass processing for innovation and value aggregation*



### ■ ISI Strategic Markets Segments:

- Sugar and ethanol producers, pulp and paper, biofuels and biodiesel, chemical industry.

### ■ Service Portfolio / Technology Platforms:

- Sustainable solutions for productive processes;
- Transport and treatment of new raw material;
- Development of innovative processes for biomass and residue conversion;
- Development of new biomass-based products and industrial applications.

### ■ Infrastructure and Team:

- New building under construction: 4.500 m<sup>2</sup>.
- Current staff: 5 researchers and specialists.
- Planned staff: 27 researchers and specialists.

Investments >> DR: R\$ 4.739.835,00 | BNDES: R\$ 30.109.870,00 | **TOTAL: R\$ 34.849.705,00**

Inauguration of the Institute Estimated for: Month/Year

Location of the Institute: Três Lagoas/MS

## *Innovative solutions in strategic minerals and sustainability on the mining industry*



### ■ ISI Strategic Markets Segments:

- Producers of Bauxite, niobium, Phosphate, Potassium, Nickel, Rare Earths, Iron Ore and Aluminum Manufacturers.

### ■ Service Portfolio / Technology Platforms:

- Development and improvement of mineral technologies by using a pilot plant;
- “Fab Lab” for refining of small amounts of strategic minerals;
- Computational modeling and simulation of processes in mining and extractive metallurgy;
- Development of the value chain on strategic minerals;
- Waste management, reduction of impacts and recovery of damaged areas.

### ■ Infraestructure and Team:

- New building under construction: 10.000 m<sup>2</sup>.
- Team in formulation. Planned: 30 researches and specialists.

Investments >> DR: R\$ 11.219.836,00 | BNDES: R\$ 38.700.000,00 | **TOTAL: R\$ 49.919.836,00**

Inauguration of the Institute Estimated for: Month/Year

Location of the Institute: Phase I - Sede FIEPA / Phase II - Parque de Ciência e Tecnologia do Guamá

## *Software-intensive innovative solutions*



### ■ ISI Strategic Markets Segments:

- Oil and gas, Energy, Automotive, Defense, Agribusiness, Public Services (ex. Urban Mobility), Internet of Things.

### ■ Service Portfolio / Technology Platforms:

- Prospective research in new ICT technologies;
- Consulting in ICT Innovation;
- New ICT concepts design;
- Development of customized software-intensive solutions;
- Complex ICT systems integration;
- ICT systems life-cycle management.

### ■ Infraestructure and Team:

- New building under construction: 11.076,45m<sup>2</sup>.
- Current staff: 6 researchers and specialists.
- Planned staff: 18 researchers and specialists.
- Network.

Investments >> DR: R\$ 4.000.000,00 | BNDES: R\$ 48.000.000,00 | **TOTAL: R\$ 52.000.000,00**

Inauguration of the Institute Estimated for: August/2015

Location of the Institute: Porto Digital / Complexo SENAI Santo Amaro



*Innovative solutions in electrochemistry, materials and nanotechnology*



## ■ ISI Strategic Markets Segments:

- Oil and Gas, Energy, Automotive, Furniture, Metal-Mechanical, Chemical Industry, Batteries, Mining, Construction, Cosmetics and Perfumery, Pulp and Paper, human and animal health, Agrobusiness, Food & Beverage, Environmental, Electrical and Electronic and Automation and Confection.

## ■ Service Portfolio / Technology Platforms:

- Analysis of Corrosion and Protection;
- Sensors in the areas of health, food, environment;
- Smart paints, new materials and nanotechnology;
- Optimization of electrochemical processes;
- Electric energy cumulators.

## ■ Infrastructure and Team:

- New building under construction 9.9500 m<sup>2</sup>.
- Current team: 3 researchers, 1 specialist, 1 technician, 1 administ.
- Planned team: 15 researchers and specialists.

Investments >> DR: R\$ 5.000.000,00 | BNDES: R\$ 45.107.890,00 | **TOTAL: R\$ 50.107.890,00**

Inauguration of the Institute: September/2013

Location of the Institute: Campus da Indústria / FIEP





*Innovative solutions for process simulation and automation in production lines*



## ■ ISI Strategic Markets Segments:

- Oil & Gas, Mining, Automotive, Metalurgy and Entertainment.

## ■ Service Portfolio / Technology Platforms:

- Intelligent Interactive Systems:
  - System integration applied to processes;
  - System integration applied to technologies.
- Mathematical Modelling:
  - Stochastic modelling, non-physical;
  - Mathematical physical modelling.
- Prototyping and Engineering.

## ■ Infrastructure and Team:

- New building under construction.
- 4 Employees + 13 researchers under recruitment.
- 3 years of experience (CTS Automação e Simulação) with applied research for virtual simulation.

Investments >> DR: R\$ 2.841.211,00 | BNDES: R\$ 15.658.789,00 | **TOTAL: R\$ 18.500.000,00**

Inauguration of the Institute Estimated for: Month/Year

Location of the Institute:Complexo CTS-Automação



*Innovative applied chemistry solutions for the broad field of engineering*



## ■ ISI Strategic Markets Segments:

- Oil & Gas, Petrochemical, Pharmaceutical, Food & Beverage, Biofuels and Biodiesel.

## ■ Service Portfolio / Technology Platforms:

- Characterization and performance evaluation of products and chemical formula;
- Product, chemical formula and process optimization;
- Process development;
- Product development.

## ■ Infrastructure and Team:

- New building under planning.
- New team building.
- 6 years experience (CTS Ambiental) with applied research within the chemical field.

Investments still under estimation

Inauguration of the Institute Estimated for: Month/Year

Location of the Institute:Complexo CTS-Ambiental



## *Systems of renewable energies for industrial and residential facilities*



### ■ ISI Strategic Markets Segments:

- Electric Energy, Oil and Gas, Machinery and Equipment, Infrastructure, Information Technology.

### ■ Service Portfolio / Technology Platforms:

- System Design and Equipment for Renewable Energy:
  - Rotor Projects;
  - Design of Components and Systems for Distributed Generation;
  - Technical Mapping for Renewable Energy Potential.
- Operating Projects for Producers of Renewable Energy Systems:
  - Technical Operating for Power Generation Systems;
  - Design and Development of Intelligent Systems and Controllers for Distributed Generation.

### ■ Infrastructure and Team:

- ISI Building (under construction) with 5.150m<sup>2</sup>.
- Current team: 1 Director. Planned team: 32 researchers/specialists.

Investments >> DR: R\$ 4.328.889,00 | BNDES: R\$ 21.983.338,00 | **TOTAL: R\$ 26.312.227,00**

## *Innovative Solutions in Polymers*



### ■ ISI Strategic Markets Segments:

- Elastomers, Plastics, Paints, Petrochemical, Chemical, Composites, Adhesives and Polymeric product users.

### ■ Service Portfolio / Technology Platforms:

- Elastomers and Thermoplastics;
- Blends and Composites;
- Additives, Reinforcement and Polymer Processing;
- Polymer synthesis; New polymeric materials;
- Sustainable paints and adhesives for special applications;
- Numerical Simulation, Products and Process performance;
- Recycling and Sustainability.

### ■ Infrastructure and Team:

- Current building: 1,800 m<sup>2</sup>. New one under construction: 5,200 m<sup>2</sup>.
- Current staff: 49 employees (8 researchers and specialists).
- Planned staff: 61 employees (12 researchers and specialists).

Investments >> BNDES: R\$ 27.789.782,00 | **TOTAL: R\$ 27.789.782,00**

Inauguration of the Institute Estimated for: March/2015

Location of the Institute: Complexo SENAI CETEPO





*Process innovation, integrated solutions and machine-tool project*



## ■ ISI Strategic Markets Segments:

- Manufacturer of Machines and Equipments, Tool Manufacturing, Manufacturer of Products and metallic Components, Manufacturer of Steel & Polimers, Oil & Gas & Energy, Power Electronics, Automotive, Agricultural Machines.

## ■ Service Portfolio / Technology Platforms:

- Applications of new metallic and non metallic materials
- Design and development of products, machines and components;
- Design and optimization of manufacturing systems;
- Metrology and quality control.

## ■ Infrastructure and Team:

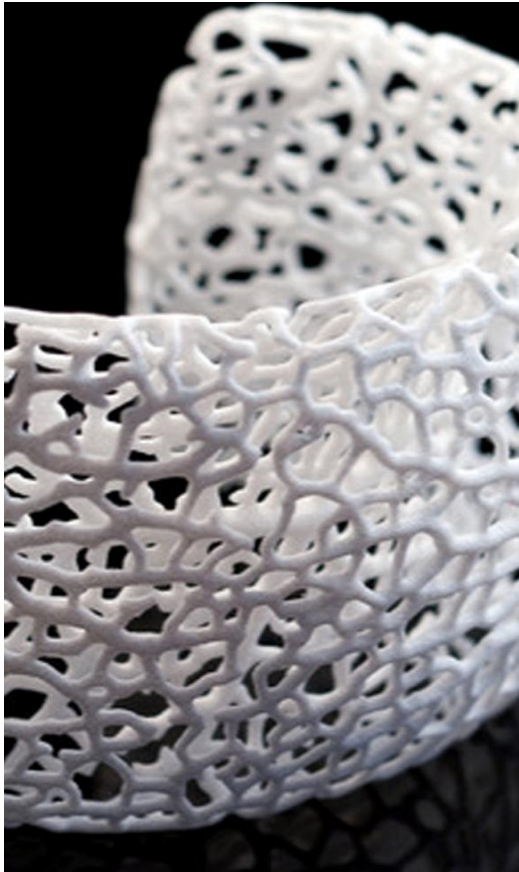
- New building under construction: 3.195m<sup>2</sup>.
- Current staff: 7 researchers and specialists.
- Planned staff: 32 researchers and specialists.

Investments >> DR: R\$ 3.550.700,00 | BNDES: R\$ 23.957.415,00 | **TOTAL: R\$ 27.508.115,00**

Inauguration of the Institute Estimated for: Month/Year

Location of the Institute: Complexo SENAI CETEMP

*Modeling, simulation and manufacturing for systems that require high production precision*



## ■ ISI Strategic Markets Segments:

- Aerospace, Automotive, Energy, Metalmechanics, Oil & Gas, Health, Dental.

## ■ Service Portfolio / Technology Platforms:

- Process development;
- Machinery and product development;
- Materials development and characterization.

## ■ Infraestructure and Team:

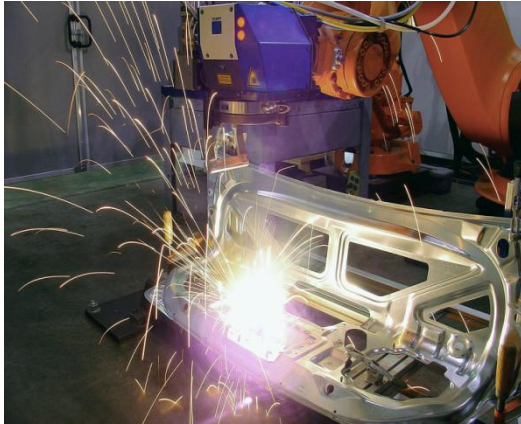
- New building under construction: 5.210m<sup>2</sup>.
- Current staff: 34 researchers and specialists.
- Future staff under planning.

Investments >> DR: R\$ 5.707.991,85 | BNDES: R\$ 6.764.478,07 | **TOTAL: R\$ 12.472.469,92**

Inauguration of the Institute: February/2014

Location of the Institute: Complexo SENAI Joinville

## *Solutions for laser applications in several knowledge areas*



### ■ ISI Strategic Markets Segments:

- Oil, gas and energy, Metal Mechanics, Aerospace, Naval, Automotive, Electroeletronics, Dental.

### ■ Service Portfolio / Technology Platforms:

- LASER Cutting;
- LASER Welding;
- LASER additive manufacturing;
- LASER Surface technology;
- System Technology & Processes Control;
- LASER technology consulting and tests.

### ■ Infraestructure and Team:

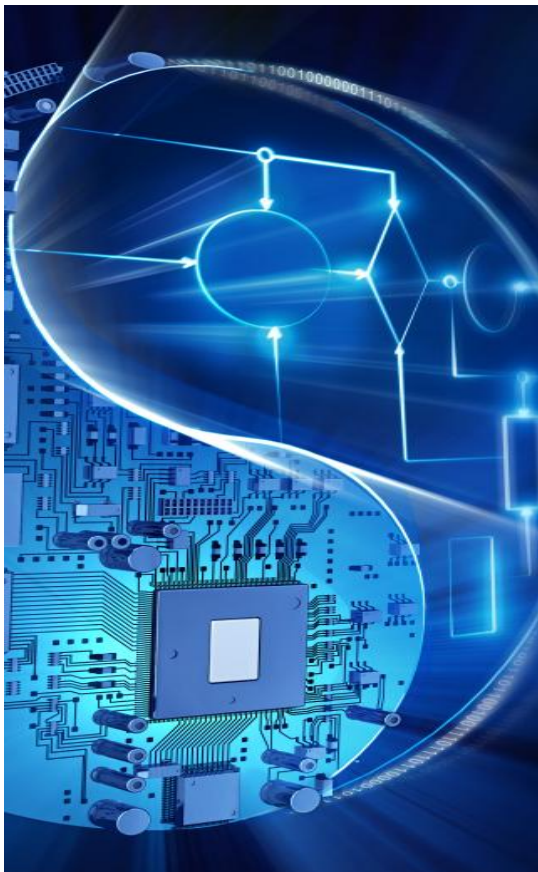
- New building under construction: 3.220 m².
- Current staff: Director and one intern.
- Planned staff: 20 researchers and specialists.

Investments >> DR: R\$ 364.766,58 | BNDES: R\$ 33.697.057,50 | **TOTAL: R\$ 34.061.824,08**

Inauguration of the Institute Estimated for: Month/Year

Location of the Institute: Complexo SENAI Joinville

*Innovative solutions in cyber-physical systems in a time, cost and risk managed manner*



## ■ ISI Strategic Markets Segments:

- Energy, Oil & Gas, Telecom, Automation & ICT, Health, Automotive, Aerospace, Defense.

## ■ Service Portfolio / Technology Platforms:

- Control and optimization systems;
- Signal processing and data mining;
- Communication systems;
- Verification, simulation and quality management.

## ■ Infraestructure and Team:

- New building under construction: 2.150 m<sup>2</sup>.
- Located in an innovation ecosystem with university labs, research centers and an incubator for small and medium enterprises.
- In structuring process together with UFSC, UFRGS and SENAI Florianópolis.

Investments >> DR: R\$ 2.865.982,00 | BNDES: R\$ 17.077.476,88 | **TOTAL: R\$ 19.943.458,88**

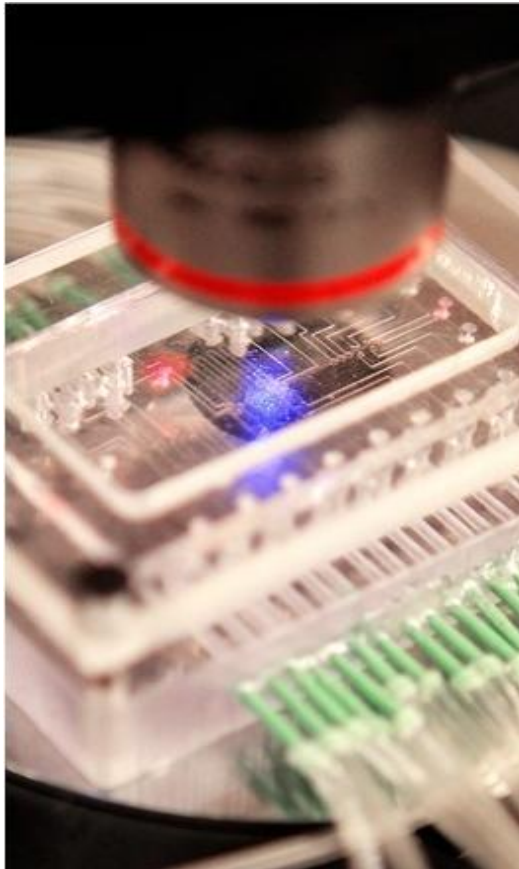
Inauguration of the Institute Estimated for: Month/Year

Location of the Institute: Phase I - SENAI CTAI / Phase II - Parque Tecnológico Sapiens Parque





## *Innovation for the manufacturing of micro-components*



### ■ ISI Strategic Markets Segments:

- Health, Oil & Gas, Aeroespacial, Defense, Energy and Automation.

### ■ Service Portfolio / Technology Platforms:

- Modelling, simulating, prototyping;
- Product design;
- Process development for micro-manufacturing (machining, micro-EDM, Laser, rapid prototyping);
- Metrological systems for micro-/nano-systems;
- Micro-assembly;
- Non-destructive tests and inspection of micro-components.

### ■ Infraestructure and Team:

- Existing building: 11.790m<sup>2</sup>.
- Current staff: 7 researchers and specialists.

Investments >> DR: R\$ 28.100.000,00 | **TOTAL: R\$ 28.100.000,00**

Inauguration of the Institute Estimated for: Month/Year

Location of the Institute: Escola SENAI Suíço-Brasileira

## *Innovative solutions for ceramics application*



### ■ ISI Strategic Markets Segments:

- Energy, Oil & Gas, Health, Textile, Machines & Equipments, Automotive, Aeronautics.

### ■ Service Portfolio / Technology Platforms:

- Modelling and simulation;
- Development of structural nano-composites;
- Development of nano-structured functional surfaces;
- Development of advanced material (ceramics, polymers) and production processes;
- Physical and chemical nanometrology tests;
- Advanced material prototyping.

### ■ Infrastructure and Team:

- Existing building: 56.000m².
- Current staff: 10 researchers and specialists.

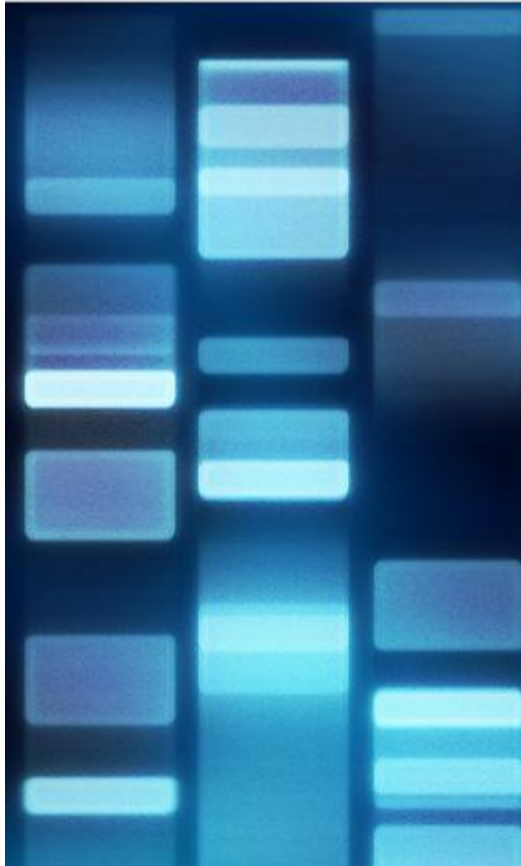
Investments >> DR: R\$ 36.400.000,00 | **TOTAL: R\$ 36.400.000,00**

Inauguration of the Institute Estimated for: Month/Year

Location of the Institute: Escola SENAI Mario Amato



## *Innovative solutions for bioengineering*



### ■ ISI Strategic Markets Segments:

- Health, Food, Environment, Energy, Pulp & Paper, Pharmaceutical, Chemical, Cosmetics and Defense.

### ■ Service Portfolio / Technology Platforms:

- Development of bioactive materials;
- Development of biomaterials;
- Development of biosensors;
- Scale-up and optimization of bioprocesses;
- Identification, characterization and development of new analytical methodologies for biotechnology;
- Support innovation in the biopharma field.

### ■ Infrastructure and Team:

- New building under construction: 15.000 m².
- Current staff under recruitment: 10 researchers and specialists.
- Alignment with Grupo Farma Brasil, ABIHPEC and SINDUSFARMA.

Investments still under estimation

Inauguration of the Institute Estimated for: Month/Year

Location of the Institute: São Paulo/SP



## *Innovations for security and defense*



### ■ ISI Strategic Markets Segments:

- National Defense Council, Defense Industry, Aeroespacial, Electronics, Machines & Equipment.

### ■ Service Portfolio / Technology Platforms:

- Modelling and simulation;
- Electromagnetic compatibility;
- Development of composite material for defense applications;
- Product certification;
- Development of sensors and integrated devices;
- Ballistics (development and certification).

### ■ Infrastructure and Team:

- New building under construction: 2.000 m².
- New team building.
- Strong alignment with the National Defense Council, with the Defense industry as well as with COMDEFESA/FIESP.

Investments >> DR: R\$ 64.000.000,00 | **TOTAL: R\$ 64.000.000,00**


Inauguration of the Institute Estimated for: Month/Year

Location of the Institute: Centro SENAI de Tecnologia Aeronáutica



# SENAI Program for Supporting Brazilian Industrial Competitiveness

## General Initial Investments



■ Modernization/expansion of schools	R\$ 776,5 mi
■ SENAI Technology Institutes (IST)	R\$ 468,7 mi
■ SENAI Innovation Institutes (ISI)	R\$ 654,8 mi
■ <u>BNDES Funding</u>	<u>R\$ 1,5 bi</u>
■ <b>TOTAL Investments</b>	<b>R\$ 1,9 bi</b>



# Thank you for your attention!

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