

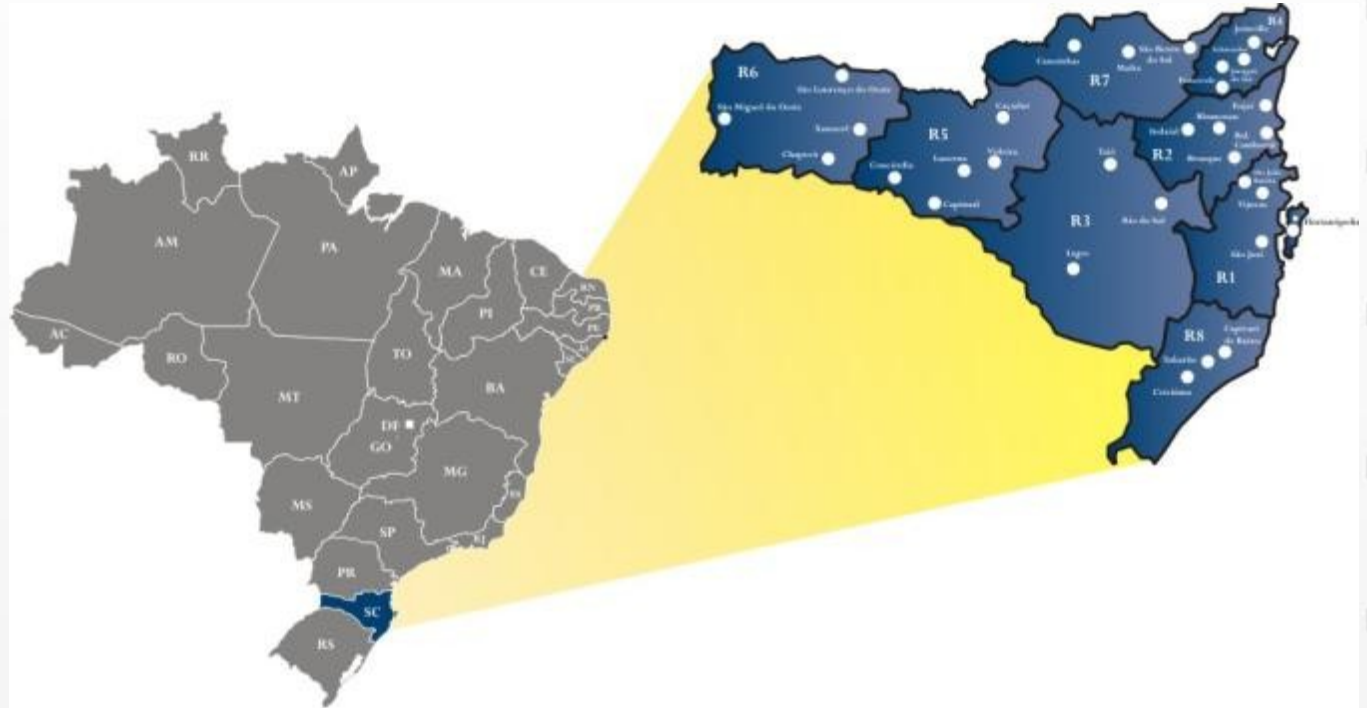


A INDÚSTRIA DO CONHECIMENTO

*Iniciativa da FIESC*

IRSES-EULANETCERMAT  
SEMINAR 28/Feb/2013

# SANTA CATARINA



Area: *95,346.181* km<sup>2</sup>;

Population: *6 million*;

GDP: *R\$ 129.8 bilhões (US\$ 68,93 billion)*;



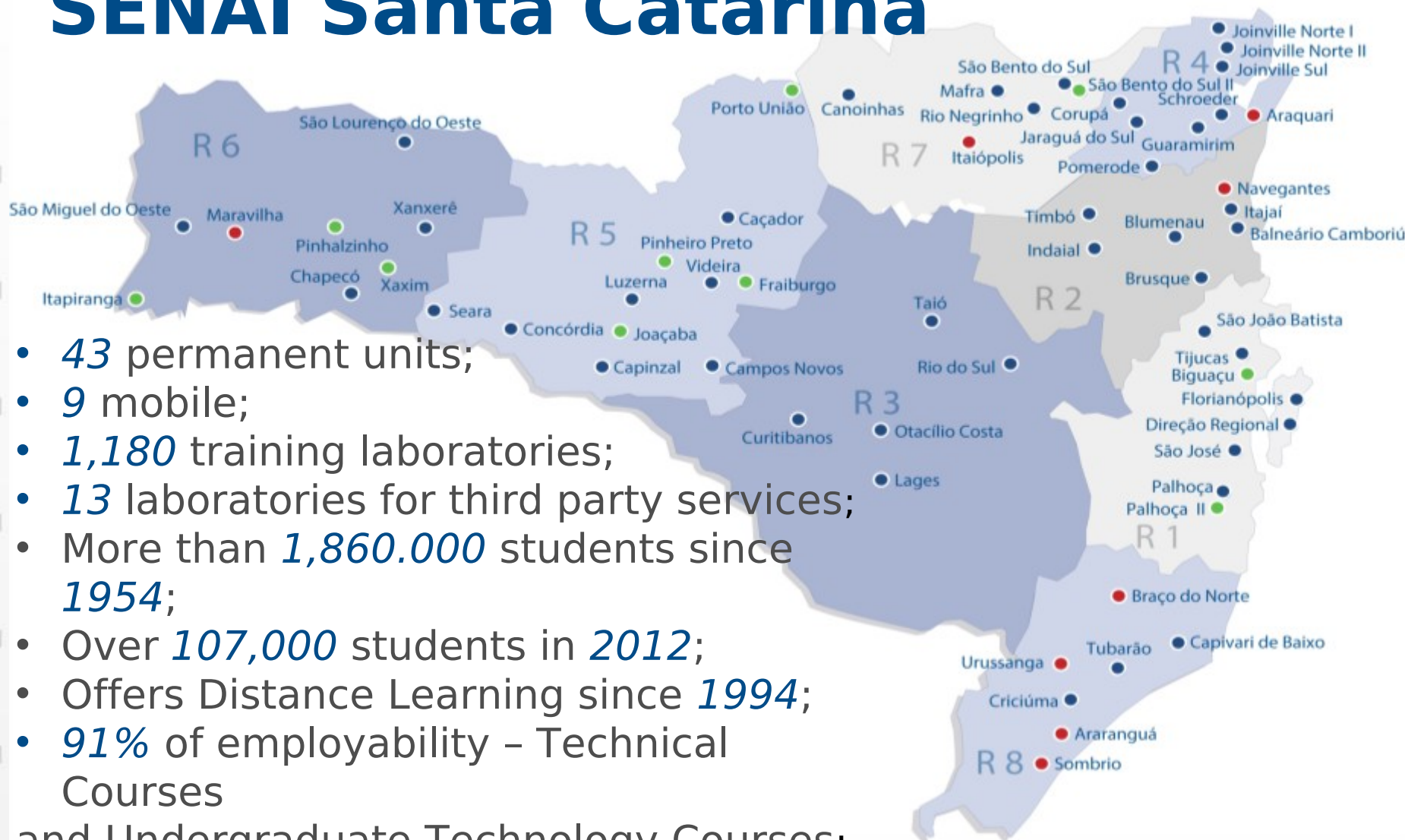
# SANTA CATARINA

## • Industry Sectors



- Construction;
- Coal and Ceramics;
- Electro Metal Mechanic
- Energy;
- Food and Beverages;
- Information Technology;
- Paper and Pulp;
- Plastics and Rubber;
- Textiles and Apparel;
- Wood and Furniture.

# SENAI Santa Catarina



- 43 permanent units;
- 9 mobile;
- 1,180 training laboratories;
- 13 laboratories for third party services;
- More than 1,860.000 students since 1954;
- Over 107,000 students in 2012;
- Offers Distance Learning since 1994;
- 91% of employability - Technical Courses

and Undergraduate Technology Courses;

- 644 consulting services in 2012, 43 current units
- Provided 100,123 hours of consulting services in 2012, 10 new Units in 2013
- 8 under negotiation for 2014

# CRICIÚMA- Industrial Complex



## Coal and Ceramics Complex



- 710 corporations;
- 18,700 workers;
- 2.7% value of manufacturing in Santa Catarina;
- 1.4% exports of Santa Catarina, *US\$ 124 million.*





# 3. SENAI Institute of Technology in MATERIALS



An inductor to **the innovation  
and technological  
modernization** process

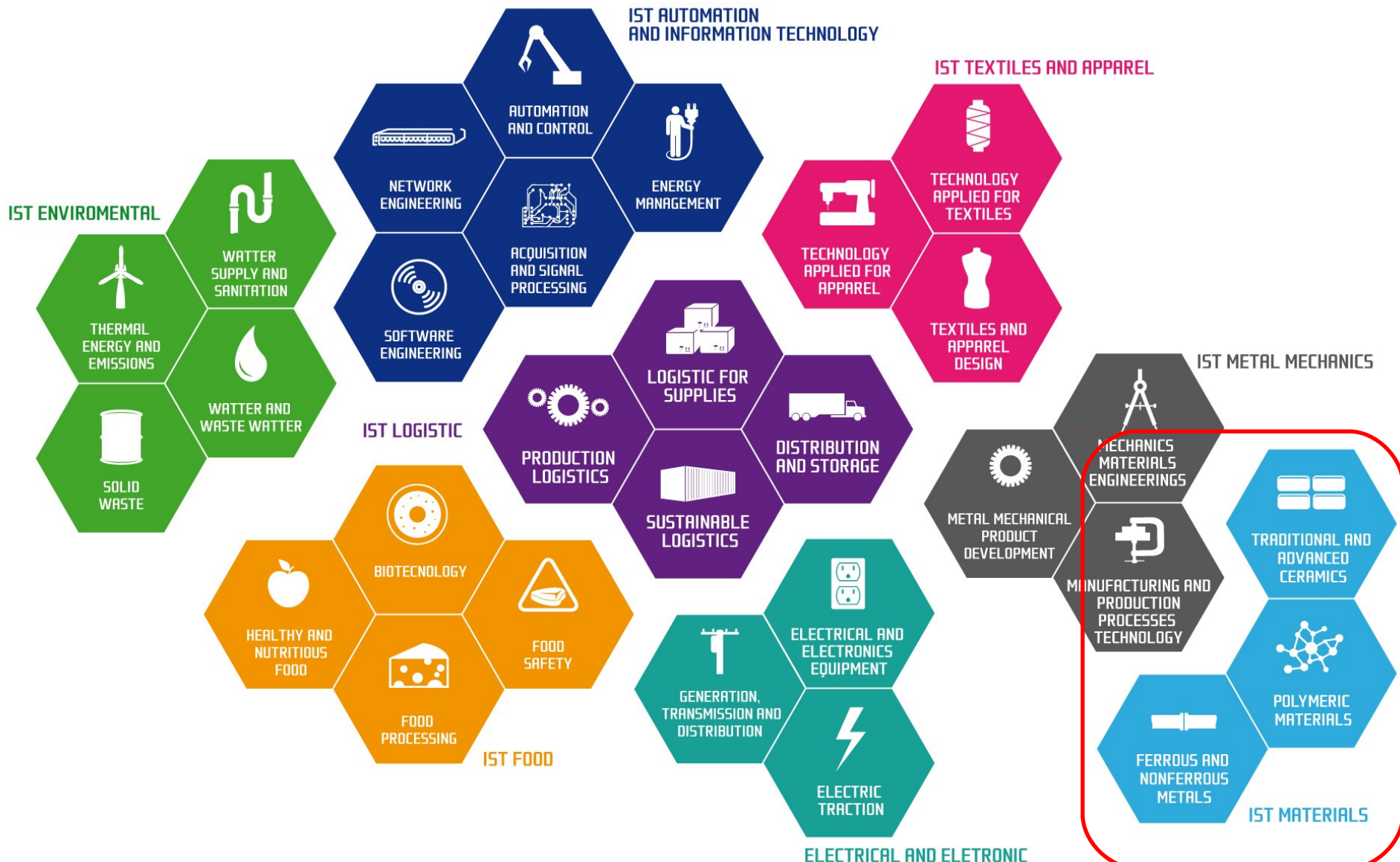


**Assist the Brazilian  
industrial sectors** in their  
developing with the focus on  
environmental sustainability



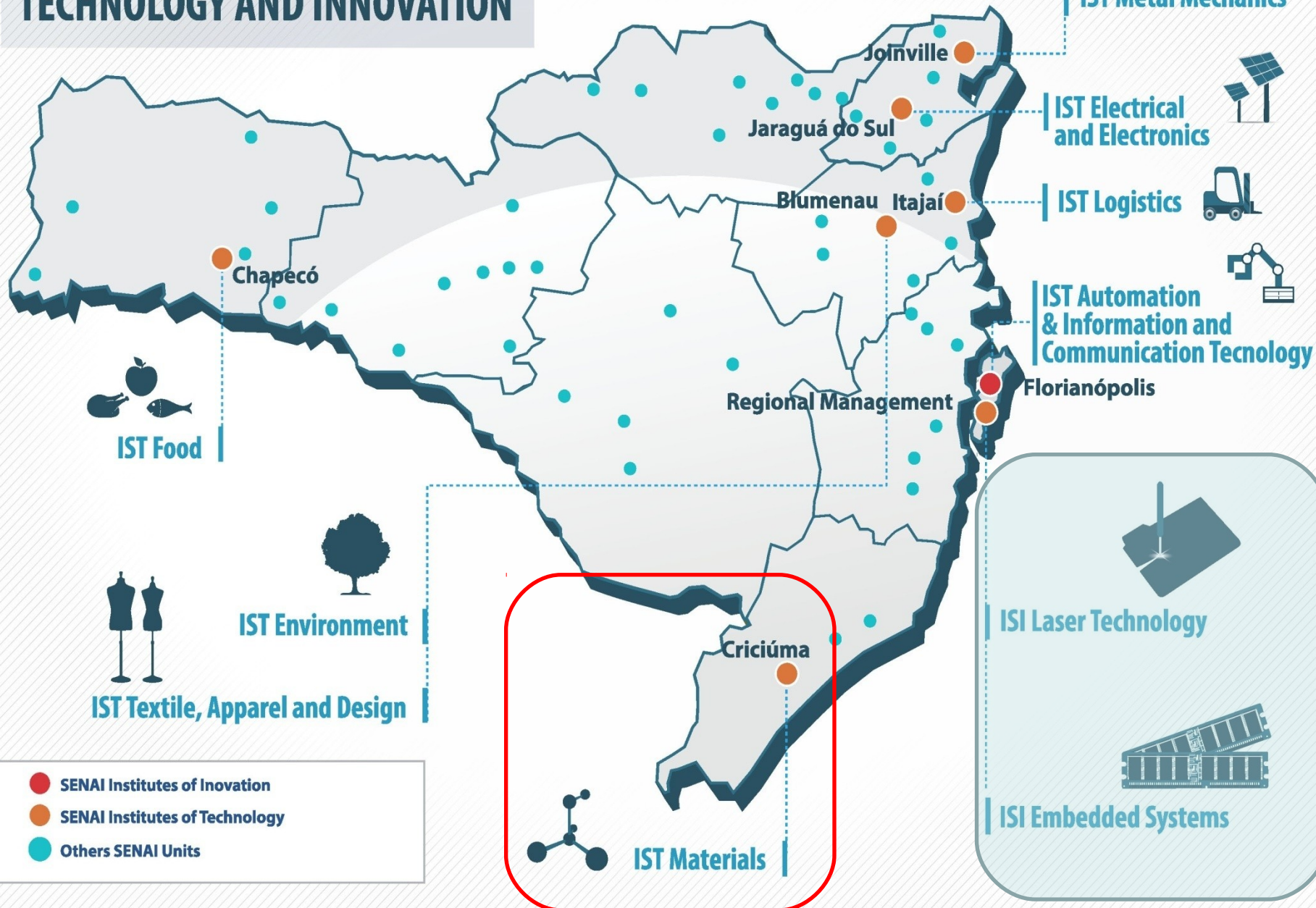
**R&D**

# SENAI Technology Institute - Technological Platforms





# SENAI INSTITUTES OF TECHNOLOGY AND INNOVATION





# SENAIsc at Criciúma Current

## Structure



Land area :  
16.530m<sup>2</sup>

Build area:  
2.548m<sup>2</sup>

Training laboratory  
: 11

IT laboratory: 05

Class rooms: 14

Workforce: 92

# Materials Area- SENAI Criciúma

## Scientific and technological production:

- 1) Works Published in the Annals of Congresses: 56
- 2) Abstracts Published in the Annals of Congresses : 66
- 3) Complete papers published in scientific journals: 66
- 4) Abstracts Published in scientific journals: 08

# Materials Area- SENAI Criciúma

## Concluded supervisions:

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- Master Dissertations: 06
- PhD Thesis: 05
- In progress – Dissertations : 02  
Thesis: 02



# Materials Area- SENAI Criciúma

## Industrial Patents:

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1. OLIVEIRA, A. P. N., HOTZA, D., MONTEDO, O. R. K., CASAGRANDE, M. Reuse of ceramic solid waste from the process of burning ceramic tiles, 2003. Additional references: Brazil/Portuguese. Means of dissemination: Printed Media. Deposit patent number: **PI 0301850-4**

2. OLIVEIRA, A. P. N., MACHADO, R. A. F., MONTEDO, O. R. K., POKRYWIECKI, J. C., CHECCHINATO, F., LOPES, C. N. Polymeric covering for application in roof tiles, bricks and ceramic tiles, 2003. Additional references: Brazil/Portuguese. Means of dissemination: Printed Media. Deposit patent number : **PI 0301849-0**

3. OLIVEIRA, A. P. N., SPINELLI, A., MONTEDO, O. R. K., PICCOLI, R. Synthesis of iron oxide pigment encapsulated in amorphous silica matrix, 2003. Additional references: Brazil/Portuguese. Means of dissemination: Printed Media. Deposit patent number : **PI 0301848-2**

4. OLIVEIRA, A. P. N., ALARCON, O. E. Composite based on vitroc ceramic matrix of the LZS (Li<sub>2</sub>O-ZrO<sub>2</sub>-SiO<sub>2</sub>) System reinforced with alumina particles, 2000. Additional references: Brazil/Portuguese. Deposit patent number : **PI 0000441-3.**

# Materials Area- SENAI Criciúma

## Most Relevants projects:

- 1) Project SENAI/SC-Pró-Pesquisa/2004 – Development of ceramic pigments from steel sector wastes and from rice husk. Coordinator: Oscar R. K. Montedo;
- 2) Project SENAI/SC-Pró-Pesquisa/2005 – Development of cutting device and machining based on vitroceramic material. Coordinator: Oscar R. K. Montedo.
- 3) Project SENAI/SC-Pró-Pesquisa/2006 – Reuse of wates from steel sector for manufacturing of industrial blocks and roof tiles in industries of red ceramic. Coordinator: Oscar R. K. Montedo.
- 4)Project SENAI/SC-Pró-Pesquisa/2007 – Developing of hydraulic bricks using wate from the laundry sector. Coordinator: Rosaura Piccoli.

# Materials Area- SENAI Criciúma

## Most Relevant projects:

- 5) Project SENAI/SC-Pró-Pesquisa/2009 – Obtaining crystalline raw materials from reuse of foundry sand tailing. Coordinator: Guilherme Colle Nascimento.
- 6) Project SENAI/SC-Pró-Pesquisa/2009 – The use of waters from laundry for manufacture of fertilizers. Coordinator: Rosaura Piccoli.
- 7) Project SENAI/SC-Pró-Pesquisa/2011 – Incorporation of tire waste for manufacturing of light concrete blocks for low cost constructions. Coordinator: Rosaura Piccoli.
- 8) Project SENAI/SC-Pró-Pesquisa/2013 – The use of solid waste from the effluent treatment station of Resicolor company as an input for manufacturing pigments and ceramic products. Coordinator: Rosaura Piccoli . Em andamento





# Materials Area - SENAI Criciúma

Research in progress and under  
prospection:

# Materials Area- SENAI Criciúma

## Research in progress:

- **Evaluation of Energy Efficiency in ceramic manufacturing processes**

System adopted: Monitoring the entire process encompassing all the heat generators, along the production process pointing spots that should be checked and upgraded to reduce thermal energy losses

# Materials Area - SENAI Criciúma

## Research in progress:

- **Development of biodegradable packaging tube type**

**Call SESI/SENAI of Innovation of 2009** : Packaging development

years duration

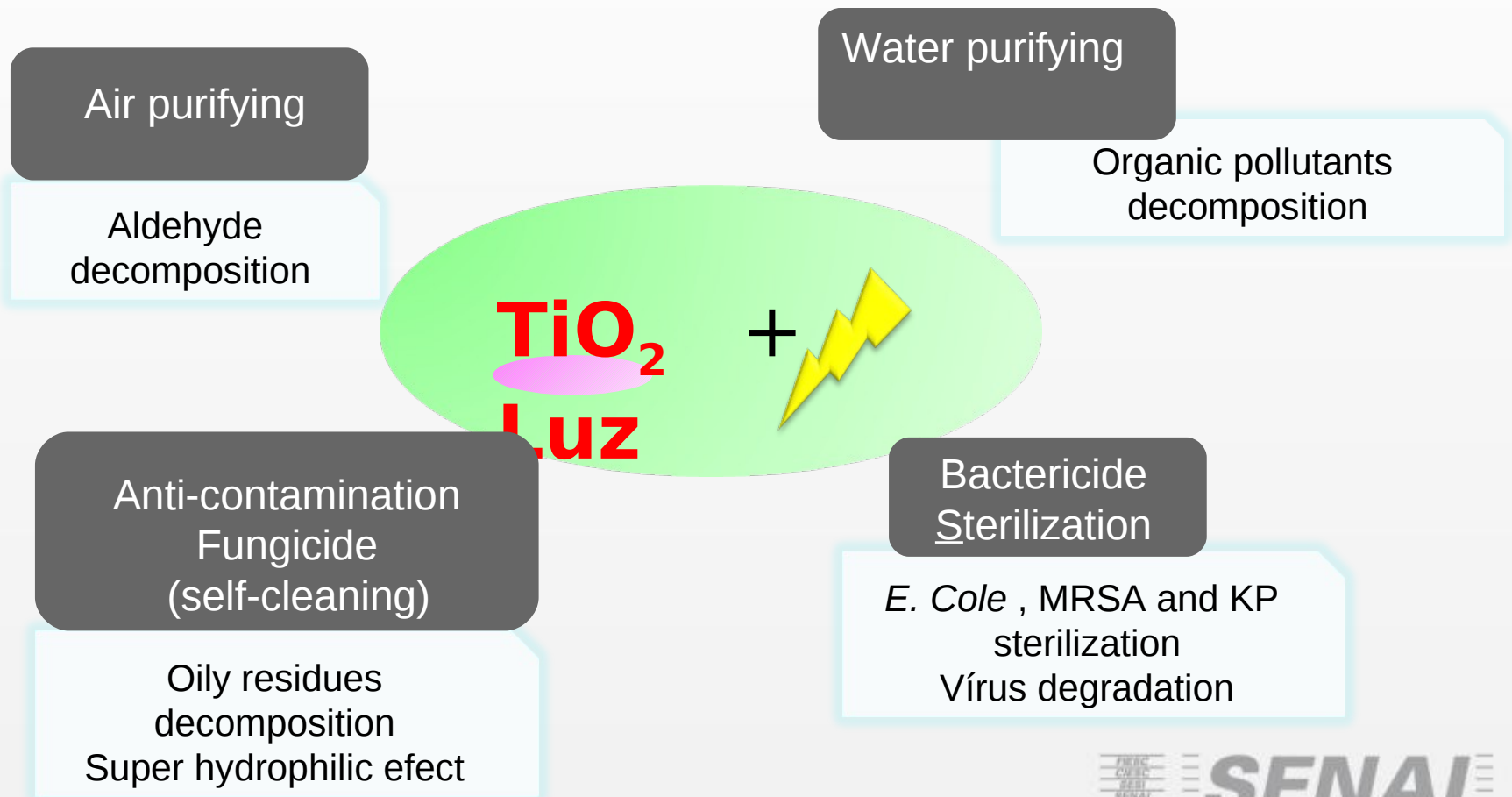
result: At the end of the project was delivered a package with after 45 days presenting degradation when exposed to suitable microbiological conditions



# Materials Area- SENAI Criciúma

## Research in progress:

### ▪ Development of photocatalytic ceramic tiles



# Materials Area- SENAI Criciúma

## Researches under prospection:

- **Projects being submitted :**

### **all Senai/Sesi of Innovation 2013 :**

Improvement biodegradable packaging to increase barrier properties

Development of Composite Materials for the manufacture of ecological products from industrial waste

Development of cellular cell from the reuse of reject the polishing of porcelain stoneware tiles

Development of ceramic coating with photocatalytic properties



*A INDÚSTRIA DO CONHECIMENTO*

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*Iniciativa da FIESC*

Thank you  
Muchas Gracias



[www.senaimaiscompetitividade.com.br](http://www.senaimaiscompetitividade.com.br)