PSA PEUGEOT CITROËN

Direction Amérique Latine

FAPESP International Workshop on Ethanol Combustion Engines

PSA approach in R&D of biofuels and engines mutually adapted

M. Sc. Flávio Gomes Dias
Forwarded Studies in Powertrain Engineering
Metier Fuels and Biofuels

Agenda

Workshop BIOEN

- Stellab and Openlabs;
- Challengers in R&D
- Ongoing projects;
- Engineering Research Center

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STELLAB & OPENLABS

STELLAB - Scientific challengers and responsibilities

Stellab and Openlabs

- The automotive industry is facing technological, environmental and societal challenges;
- Need for exploring new scientific fields;
- PSA created a network of partnerships into different scientific fields, Open Labs, managed by a multidisciplinary structure, the Stellab;
- Setting up a network of doctoral candidates, research and scientific engineers and expert groups;
- Hosting students and researchers chosen to take part in scientific programs;
- Open Labs are joint research units which will pool the group's research teams and testing resources with those of partner laboratories.

STELLAB
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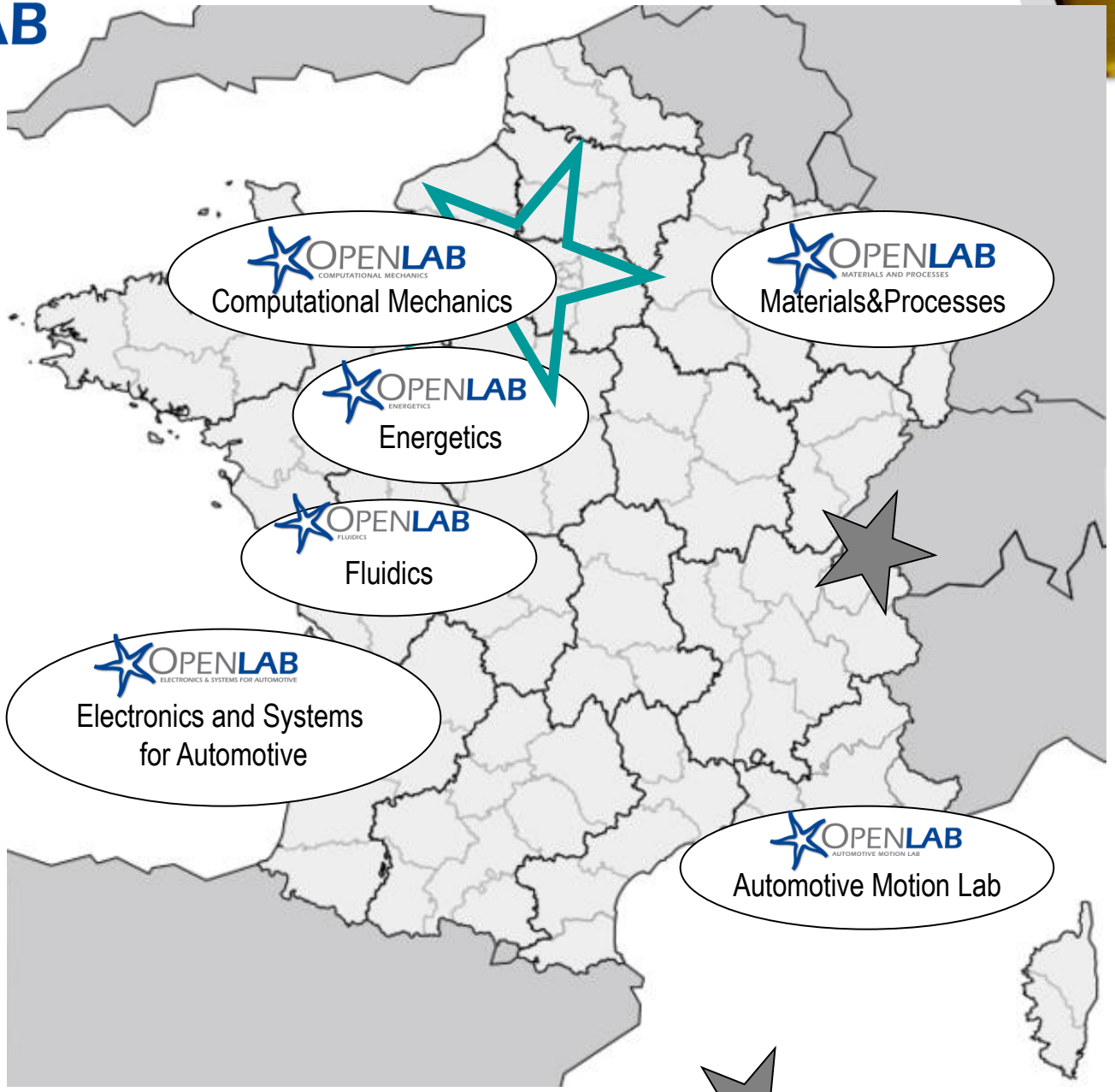
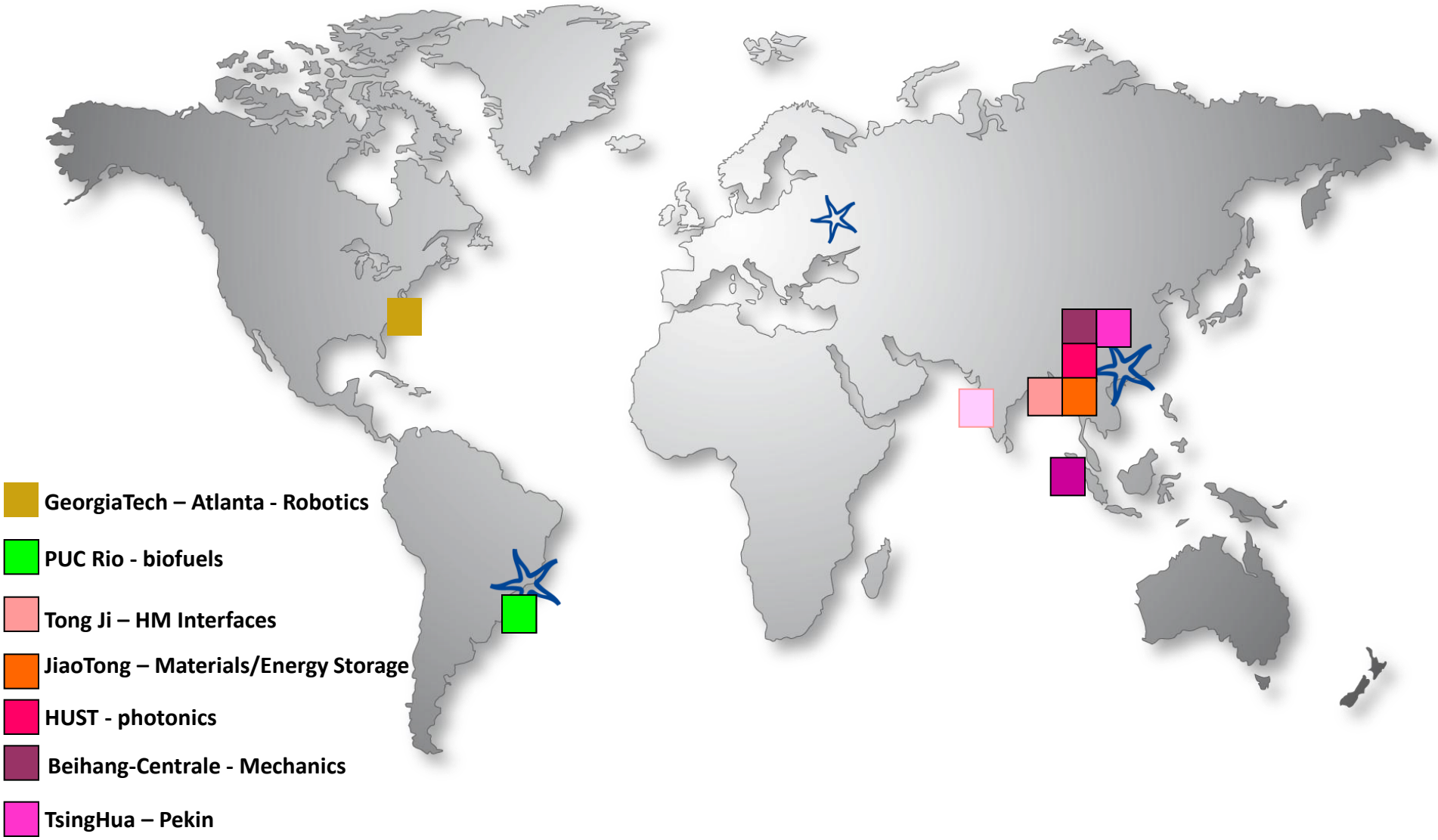


StelLab Hub

StelLab@EPFL


GeorgiaTech – Atlanta - Robotics
PUC Rio - biofuels
Tong Ji – HM Interfaces
JiaoTong – Materials/Energy Storage
HUST - photonics
Beihang-Centrale - Mechanics
TsingHua – Pekin

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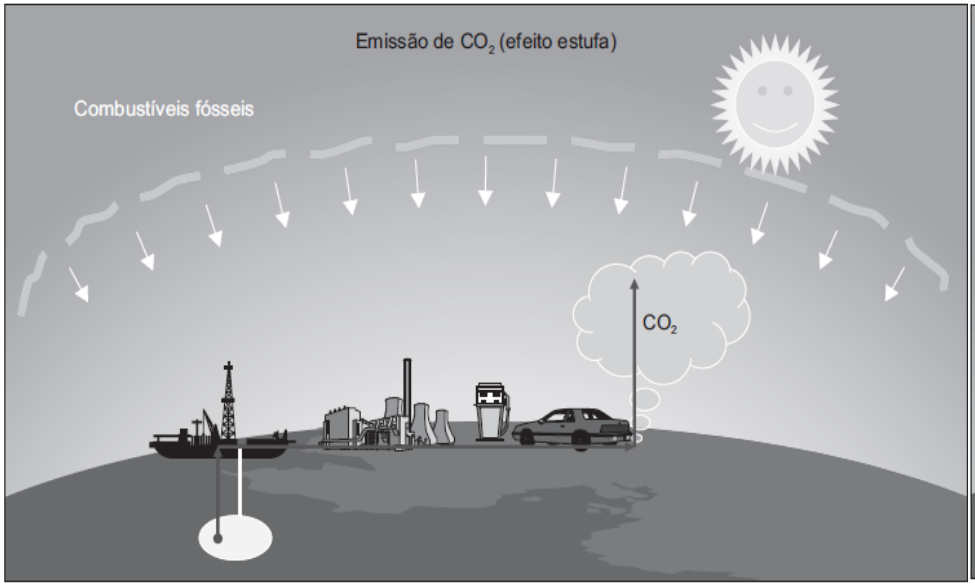
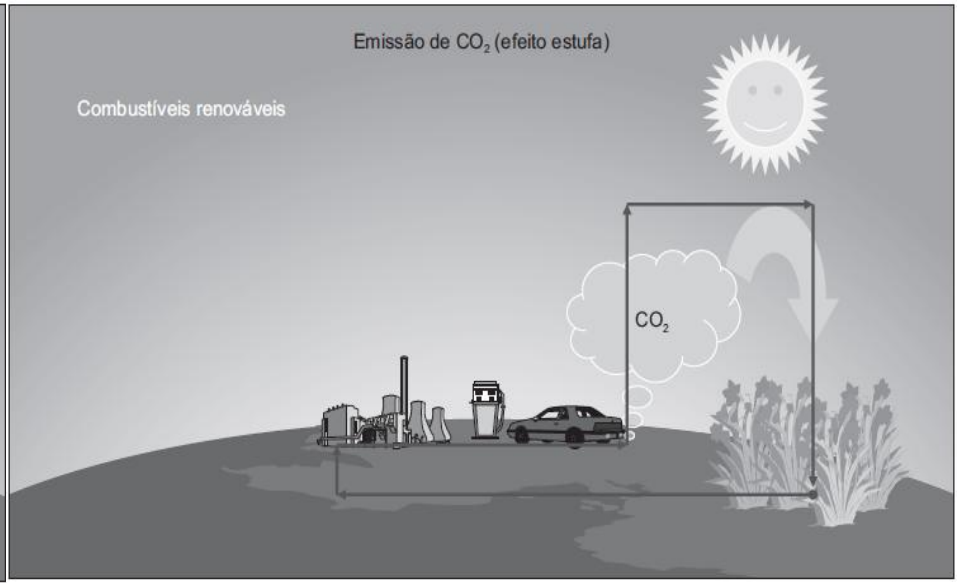
Challengers in R&D

PSA worldwide policies

Challengers in R&D

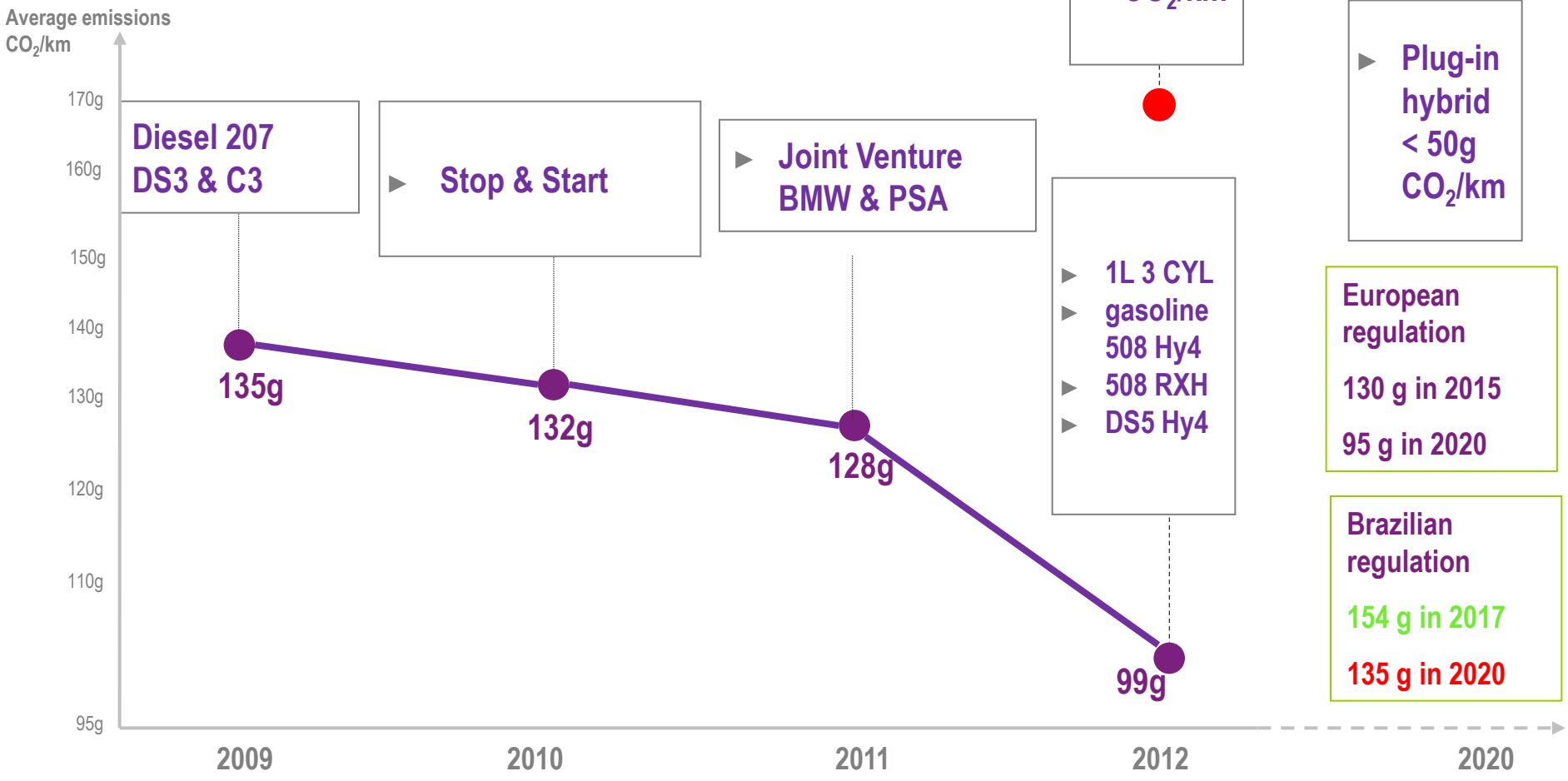
- In 2010 PSA Brazil was chosen as “Global Excellence Pole” for researches in biofuels;
- Today, PSA is worried about produce technology for reducing CO_2 emissions;
- The biofuels are one of the most important key for reaching this objective.





One step ahead and the move up-market

Challengers in R&D



European regulation

130 g in 2015

95 g in 2020

Brazilian regulation

154 g in 2017

135 g in 2020

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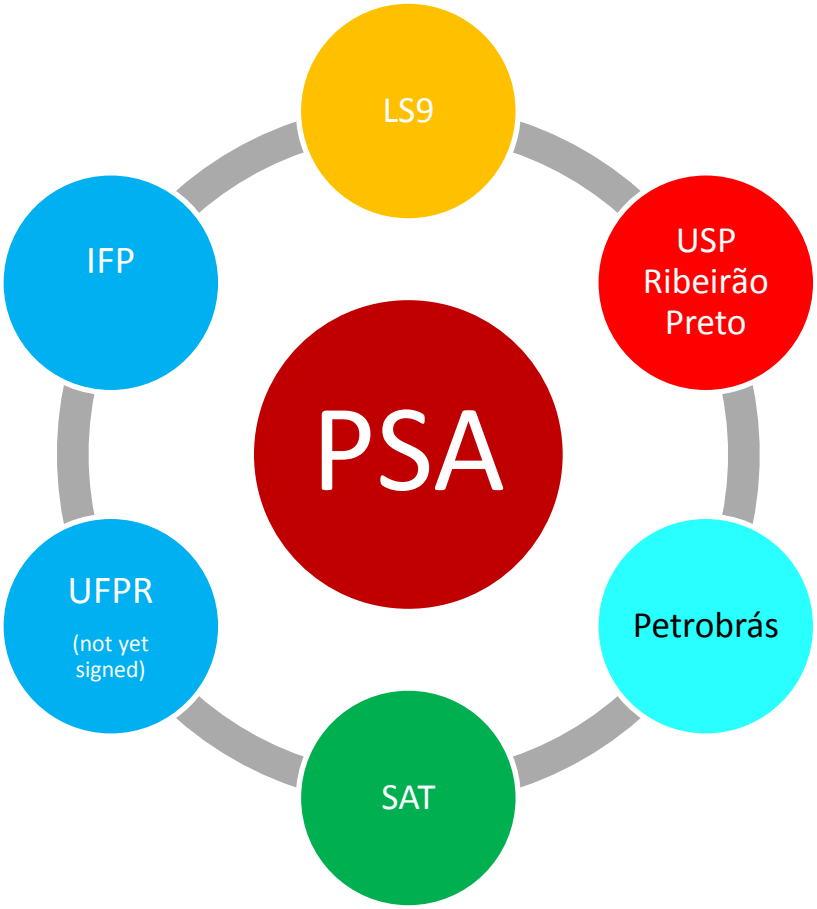
ONGOING PROJECTS

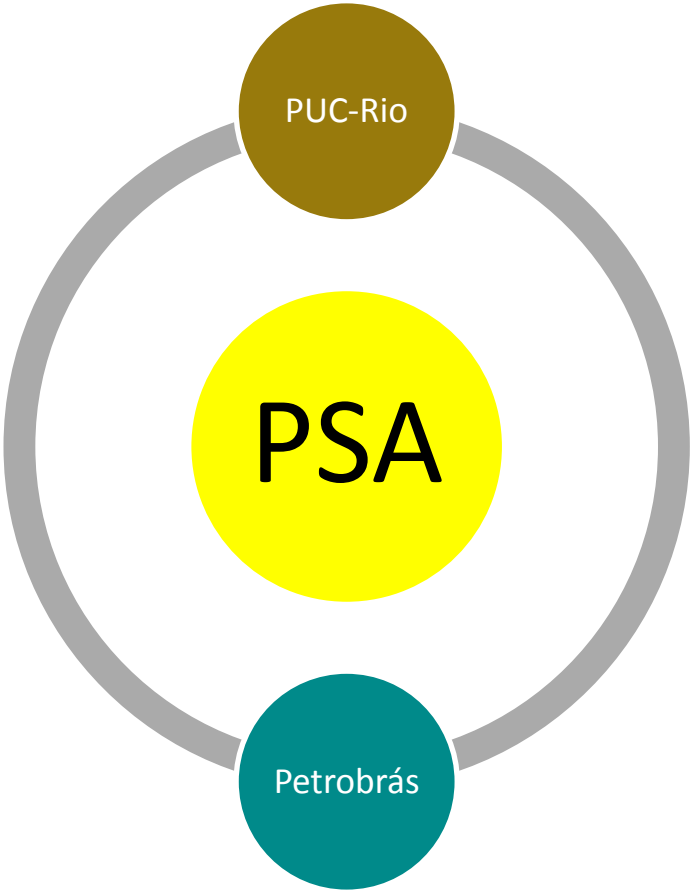
Current partnerships

Ongoing projects

Biofuels



Engine & Combustion



Partnerships with universities

Ongoing projects

- Lack of preparation for developing projects together;
- Academic institutions and corporations have different needs and time frames;
- Projects leaded by students have a clear deadline, impacting the project continuity;
- Problem for disclosing papers, concerning the confidentiality agreements;
- Find Institutions in São Paulo specialized in Internal Combustion Engines.

Cold start in DI engines with E100

Ongoing projects

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IFP Innovation Energy Environment

- Goals
  - Develop a cold start through simulation for DI engines using CFD;
  - Practical tests in vehicle;
  - Internal development of technical skills in simulation process;

Optimized flex fuel DI engine

Ongoing projects

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- Goals
  - CFD simulations of DI engines running on Ethanol, Gasoline and blends;
  - Study of material deposit;
  - Optimized performance of the engine with all blends;

Compression ignition engines with ethanol

Ongoing projects

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PUC RIO

CORIA

- Goals
  - Develop 3 different configurations;
    - Dual fuel - Diesel & Ethanol;
      - Diesel will work as a pilot injection;
    - Additivated ethanol;
      - Addition of chemical compounds to improve ethanol's characteristics;
    - HCCI;
      - A CI engine with ethanol in a homogeneous mixture;

Second Generation Ethanol

Ongoing projects

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- Goals
  - Durability tests with a PFI engine using second generation ethanol;
  - Assessment of usage impacts of this fuel in engine controlled parts;

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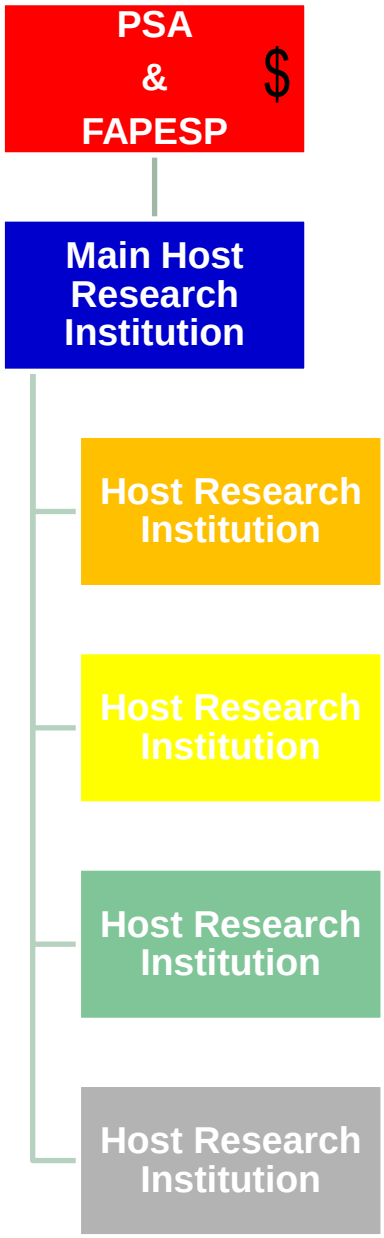
ENGINEERING RESEARCH CENTER

CEPID FAPESP

Engineering Research Center

- Research oriented to application and innovation;
- Possibility of setting up a multidisciplinary approach;
- Opportunity to bring other companies for helping in the research development and project funding;
- Support of FAPESP to control the center structure;



Agreement

Engineering Research Center

- Develop projects in the area of engine and biofuels mutually adapted;
- Edictal will be launched in November 2012;
- 10 years agreement and investments of about US$800.000,00 per year
- Link the main universities of São Paulo and other foreign universities of excellence;
- Join the best researchers from these universities;

Research subjects

Engineering Research Center

- Study the vegetable sources for oil extraction;
- Lifecycle analysis;
- Use of ethanol in CI engines;
- Study of combustion with biofuels;
- Engine durability tests with biofuels;
- Injection system material and biofuels compatibility;
- Biofuels viability;
- Social and environmental impacts;
- Worldwide scenario;

Development expectative

Engineering Research Center

- Competences in biofuels field;
- Master degree and PhD thesis;
- Patents and papers;
- Specialized laboratories in the universities;
- Engines with very low pollutants' emissions;
- Market strategies and future technologies for this sector;

THANKS FOR YOUR ATTENTION