

# R,D&I ATTRACTION TO BRAZIL



# WHY BRAZIL



## ECONOMY

13th largest economy of the world (GDP of \$1.6 trillion by 2020).



## POPULATION

Total population of 213.2 million and Economically active population (EAP) of 107.8 million.



## GDP

Diversified, integrated and flexible industry, representing 19% of Total GDP (2019).



## PRODUCTION

Fourth largest producer of grains (rice, barley, soybeans, corn and wheat) in the world, behind only China, the United States and India (In 2020, we produced 239 million tons and exported 123 million tons of grain).



## CAPACITY

26 OEMs and production capacity of 4.5 million vehicles



## AGRIBUSINESS

Strong, modern, expanding agribusiness, subject to preservation and sustainability landmarks.



## POTENTIAL

Potential to become the fifth largest consumer market in the world by 2030, surpassing France, the United Kingdom and Germany (Ernest Young and FGV).



## E-COMMERCE

Seventh largest e-commerce market, surpassing the UK, Thailand and Spain (eMarketer, 2021).



## VEHICLES

Eighth circulating fleet (OICA) and third largest used vehicle market in the world, behind only the United States and China (Kavak, 2021).

# WHY TO INVEST IN RD&I IN BRAZIL'S AUTOMOTIVE VALUE CHAIN



Market



Benefits



Competitiveness

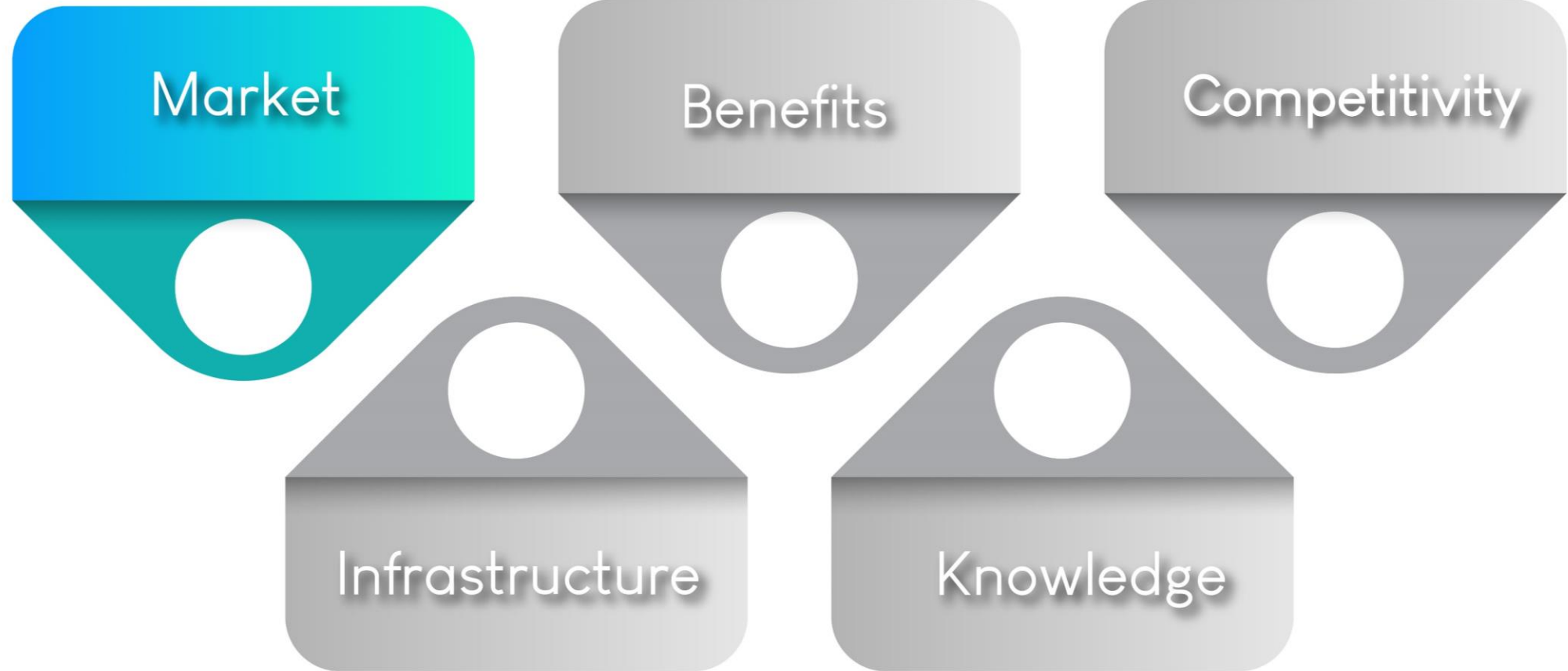


Infrastructure



Knowledge

# WHY TO INVEST IN RD&I IN BRAZIL'S AUTOMOTIVE VALUE CHAIN

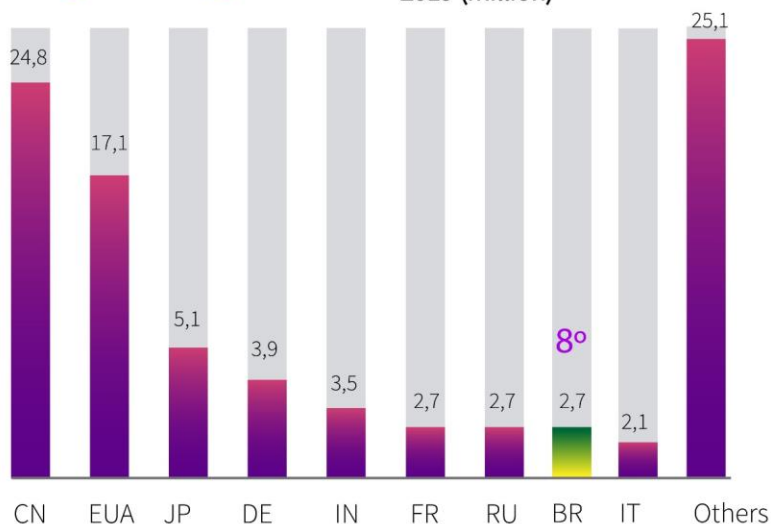


# MARKET



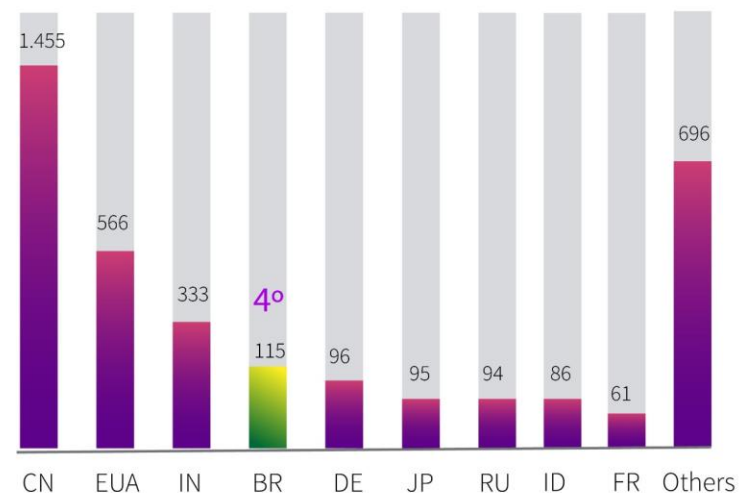
## Light Vehicles

Light vehicle sales in 2019 (million)



## Heavy Vehicles

Heavy vehicle sales in 2019 (mil)



Brazil is among the 10 largest automotive markets.

And is in eighth place considering the sale of light vehicles and fourth place, with heavy vehicles.

# AUTOMOTIVE PRODUCTION AND SALES - SELECTED COUNTRIES

## IN THOUSANDS OF UNITS

### Production

Countries	2017	2018	2019	2020	Average 2017 - 2020
1º China	29.015	27.809	25.751	25.225	26.950
2º United States	11.190	11.298	10.893	8.822	10.551
3º Japan	9.691	9.730	9.685	8.068	9.294
4º Germany	5.646	5.120	4.947	3.742	4.864
5º South Korea	4.115	4.029	3.951	3.507	3.901
6º India	4.792	5.143	4.524	3.394	4.463
7º México	4.095	4.101	4.013	3.177	3.847
8º Spain	2.848	2.802	2.823	2.268	2.685
9º Brazil	2.737	2.881	2.945	2.014	2.644
10º Russia	1.552	1.769	1.720	1.435	1.619
11º Thailand	1.989	2.168	2.014	1.427	1.900
12º Canadá	2.194	2.021	1.917	1.377	1.877
13º France	2.226	2.268	2.175	1.316	1.996
14º Turkey	1.696	1.550	1.461	1.298	1.501
15º Czech Republic	1.306	1.443	1.434	1.159	1.336

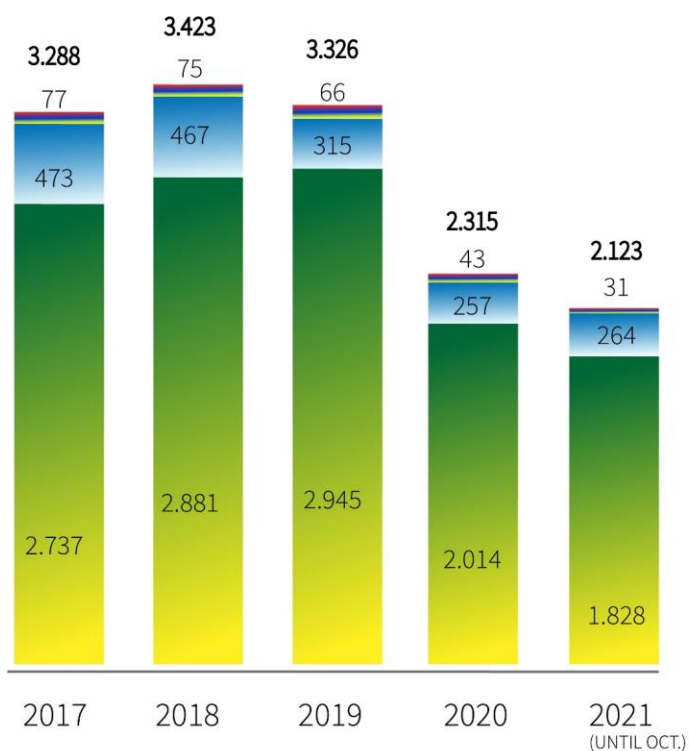
### Registration

Countries	2017	2018	2019	2020	Average 2017 - 2020
1º China	28.879	28.081	25.797	25.311	27.017
2º United States	17.551	17.701	17.037	14.453	16.686
3º Japan	5.234	5.272	5.195	4.599	5.075
4º India	4.059	4.400	3.817	2.939	3.804
5º Germany	3.810	3.822	4.017	3.268	3.729
6º United Kingdom	2.910	2.734	2.737	1.965	2.587
7º France	2.549	2.633	2.756	2.100	2.510
8º Brazil	2.240	2.566	2.788	2.058	2.413
9º Italy	2.192	2.122	2.133	1.565	2.003
10º Canada	2.039	1.985	1.937	1.528	1.872
11º South Korea	1.830	1.827	1.795	1.906	1.840
12º Russia	1.658	1.821	1.779	1.631	1.722
13º Spain	1.435	1.563	1.501	1.030	1.382
14º Mexico	1.530	1.421	1.360	976	1.322
15º Australia	1.189	1.121	1.063	917	1.073

**MARKET**

## LATAM VEHICLES PRODUCTION

(In a thousand units)

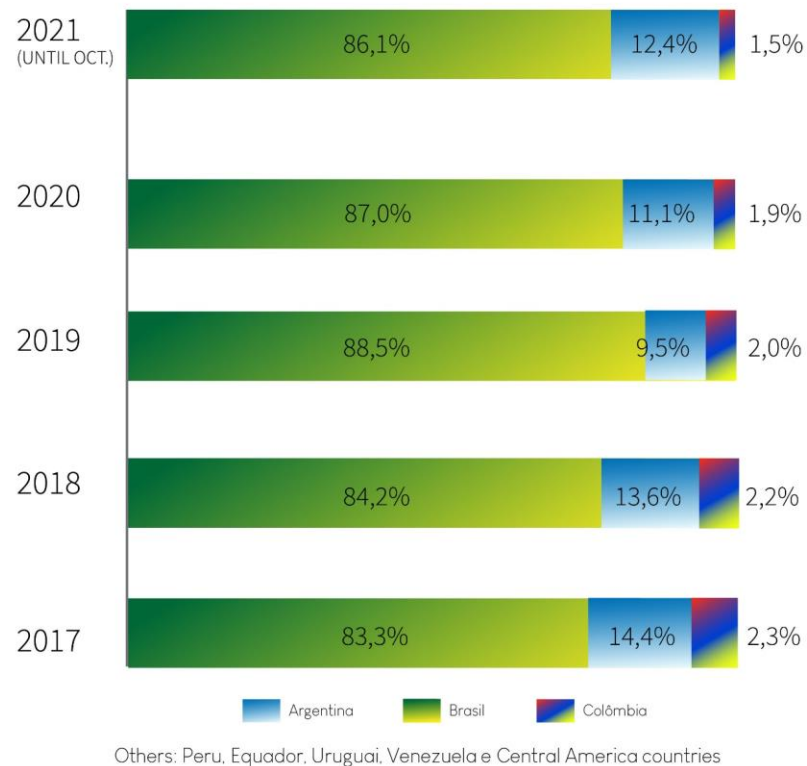


Argentina Brasil Colômbia

Others: Peru, Equador, Uruguai, Venezuela e Central America countries

## LATAM VEHICLES PRODUCTION

(In % of total)



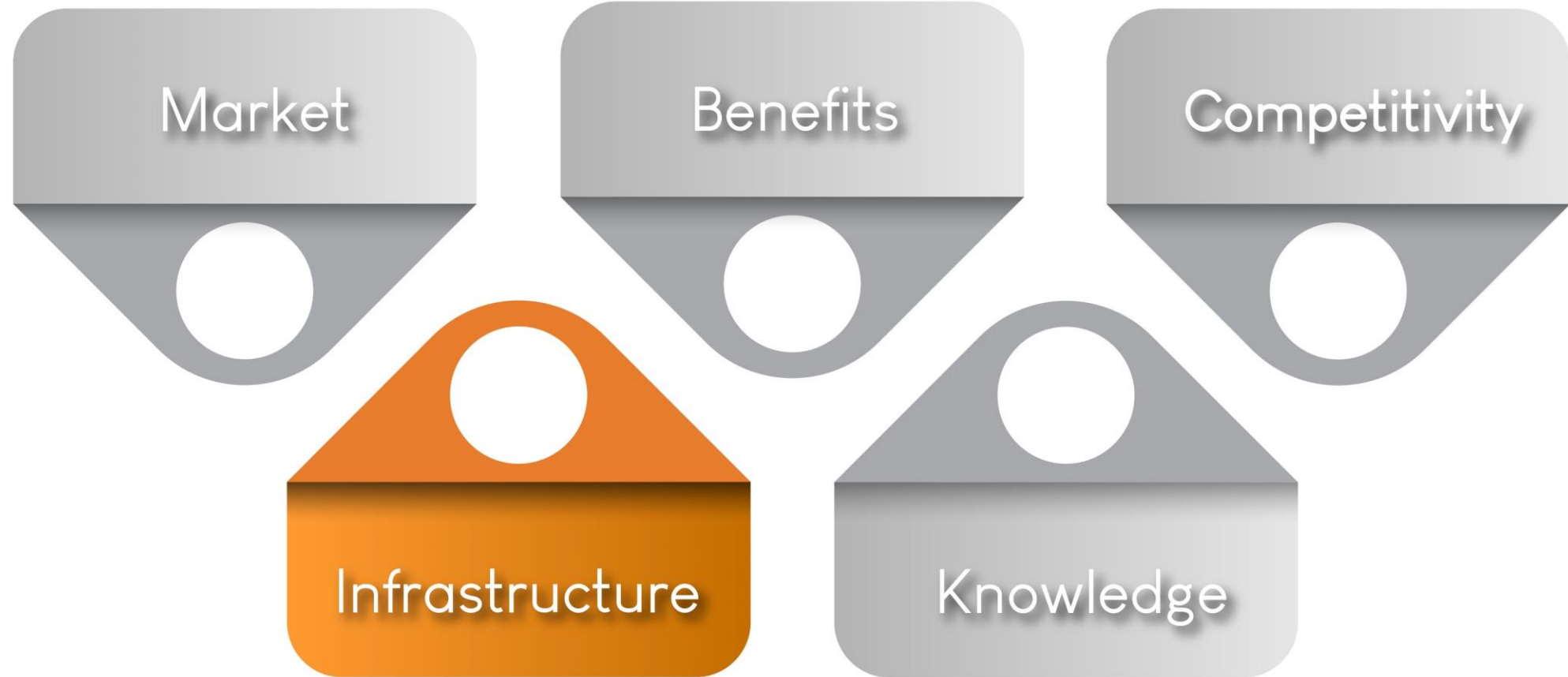
Argentina Brasil Colômbia

Others: Peru, Equador, Uruguai, Venezuela e Central America countries

Despite oscillations in the number of vehicle production, the percentage of national production stands out when compared to other South American countries.

# MARKET

# WHY TO INVEST IN RD&I IN BRAZIL'S AUTOMOTIVE VALUE CHAIN





# Research, Development and Innovation



Universities



Technological  
Parks



## INFRASTRUCTURE

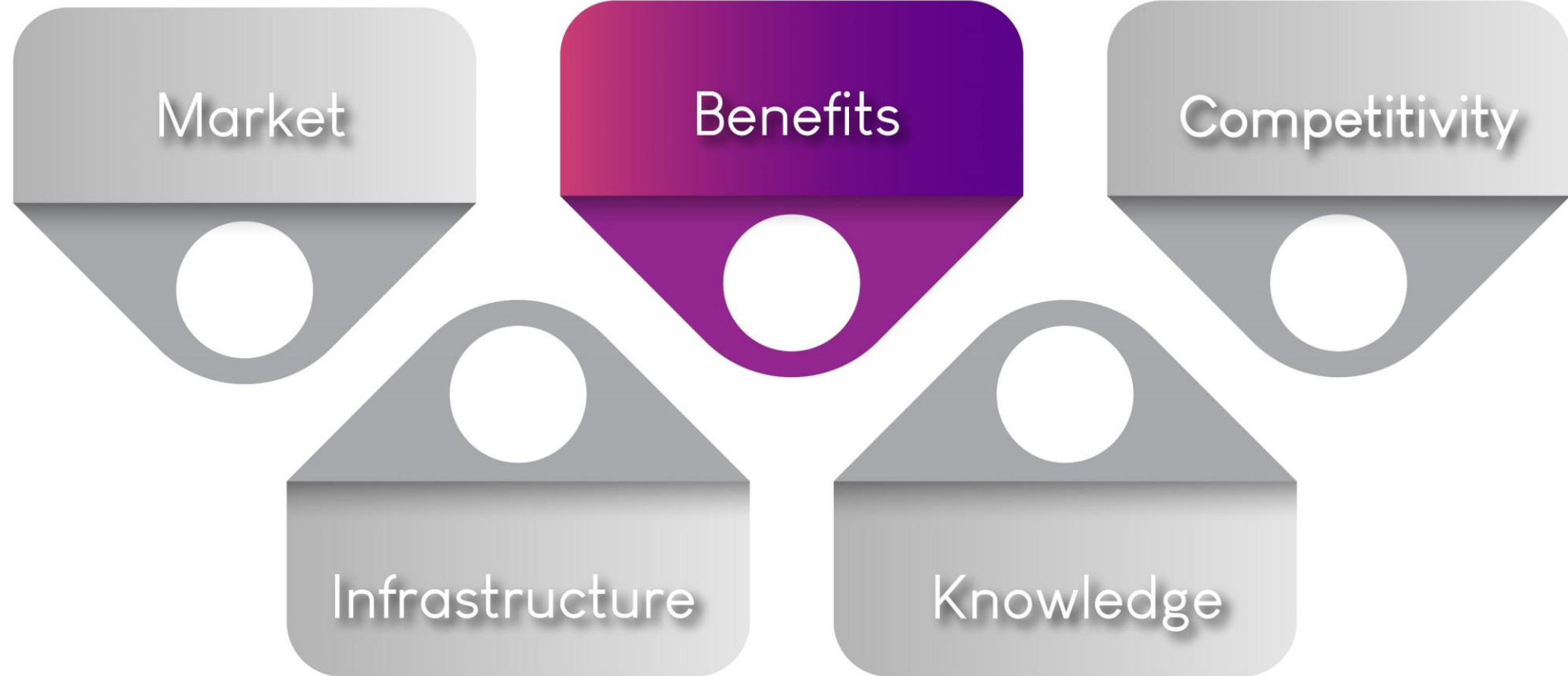
**55 Technological Parks:** environment where several companies from different segments are installed, having technology and innovation as the focal point of their business.



**305 Institutes of Science and Technology:** its main objective is to carry out and encourage scientific and technological research, developing solutions that respond to the needs of companies and society in an innovative way.

# INFRASTRUCTURE

# WHY TO INVEST IN RD&I IN BRAZIL'S AUTOMOTIVE VALUE CHAIN



# LEGAL FRAMEWORKS FOR RD&I IN BRAZIL

## ROTA 2030

Program that aims to stimulate investments in the Brazilian automotive sector, with benefits that allow a reduction of up to 15.3% of the amount spent on R&D in the IRPJ and CSLL, among others

## LEI DO BEM

Granting of tax incentives to companies that carry out research, development and technological innovation, with deduction of up to 34% of the IRPJ or CSLL

## INNOVATION LAW

First law to regulate public-private partnerships. It intends to create favorable environments to public-private partnerships in the development of solutions, encourage the outflow of academic knowledge to the corporate world and modernize the internal environments of companies.

## LEGAL FRAMEWORK FOR STARTUPS

It intends to bring a new regulatory and development environment to small technology companies, facilitating business and investment

## COMPUTER LAW

It grants tax incentives to companies in the technology sector (hardware and automation areas), that invest in Research and Development. The benefits are granted through financial credit that can vary from 1.39% to 13.65% depending on the geographic region

## PADIS

Set of federal tax incentives instituted with the objective of contributing to the attraction and expansion of investments in the areas of semiconductors and displays. Reductions reach 0% in Import taxes, IPI, Pis-Import and Cofins-Import rates for specific machines / equipment / raw materials/ software intended for the production of goods covered by the legislation

# THE NATIONAL FUND FOR SCIENTIFIC AND TECHNOLOGICAL DEVELOPMENT - FNDCT

**R\$ 9 BI**  
**in 2022**

Accounting and financial type fund whose objective is to finance innovation and scientific and technological development, in order to promote the economic and social development of the country



## PRACTICAL EXAMPLE

EMBRAPII + LEI DO BEM + ROTA 2030

$$\begin{array}{r}
 \boxed{10.0} \quad \text{Total amount in millions} \\
 - 7.0 \quad \text{EMBRAPII (50\%) + ICT (20\%)} \\
 \hline
 = 3.0 \\
 - 0.43 \quad \left. \begin{array}{l} \text{Tax incentive} \\ \text{R\$ 1.28 million} \end{array} \right\} \\
 - 0.82 \quad \left. \begin{array}{l} - \text{Rota 2030} \\ \quad 15.3\% \text{ of R\&D expenditures} \\ - \text{Lei do Bem} \\ \quad 27.2\% \text{ of R\&D expenditures} \end{array} \right\} \\
 \hline
 1.72 \\
 \downarrow \\
 \text{The company pays 17.2\%} \\
 \text{of the total project} \\
 \text{amount}
 \end{array}$$

# PROJECT - ROTA 2030

Electric Vehicle Recharging

Unit: Certi

Company: WEG Equipamentos Elétricos S.A.  
EMBRAPII Project

Development of a national line of equipment for recharging electric vehicles, the first of this nature in Brazil



# PROJECT - ROTA 2030

Company: Paranoá Indústria de Borracha Ltda

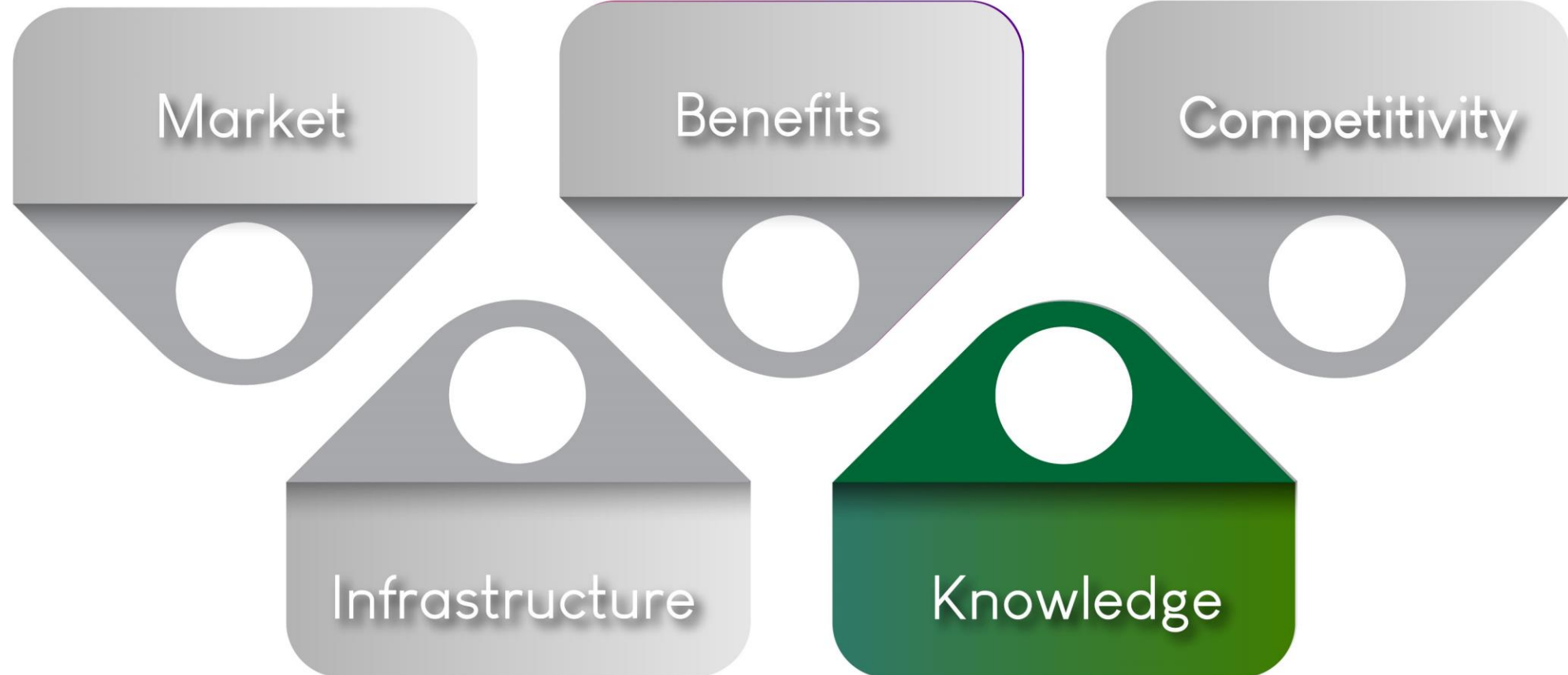
Project with: Instituto Senai de Tecnologia e Senai Armando de Arruda Pereira, São Caetano do Sul - Boa Vista

Process 4.0 combining industrial connectivity and AI for the efficient production of thermo/acoustic coating in TPO for light commercial vehicles





# WHY TO INVEST IN RD&I IN BRAZIL'S AUTOMOTIVE VALUE CHAIN



- 2,608 college education institutes in Brazil, including:  
2,076 College,  
294 university centers,  
198 universities  
40 Federal Institutes of Education and  
Federal Centers for Technological  
Education.

- 8 Universities among the 25 best in Latin  
America

- More than 1.8 million engineers  
graduated in the last 9 years.













SINDIPEÇAS ABIFEÇAS

# UNIVERSITIES:

Knowledge and academic education

**11.º**  
**IN THE**  
**INTERNATIONAL**  
**RANKING OF**  
**SCIENTIFIC**  
**PUBLICATIONS**

01		Harvard (EUA)	33.045
02		Toronto (Canadá)	22.151
03		Zhejiang (China)	20.876
04		Shangai Jiap Tong (China)	20.406
05		Michigan (EUA)	18.348
06		Tsinghua(China)	16.929
07		Johns Hopkins (EUA)	16.831
08		USP (Brasil)	16.120
09		Nacional de Seul (Coréia do Sul)	15.468
10		Standford (EUA)	15.364

## Fuel Comparison - larger shares

(Cars, Commercial vehicles, trucks, and buses)

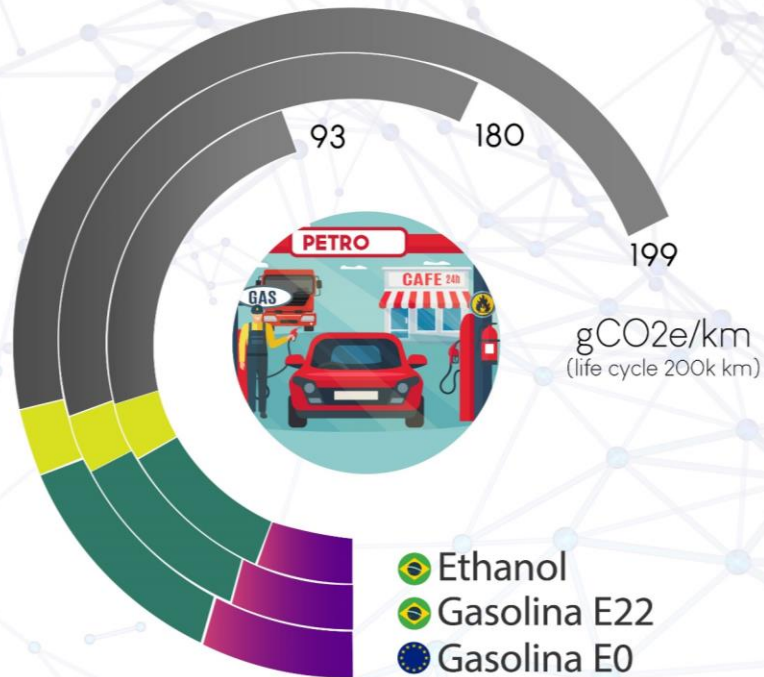


**FLEX-FUEL ENGINE:**  
Knowledge and Experience

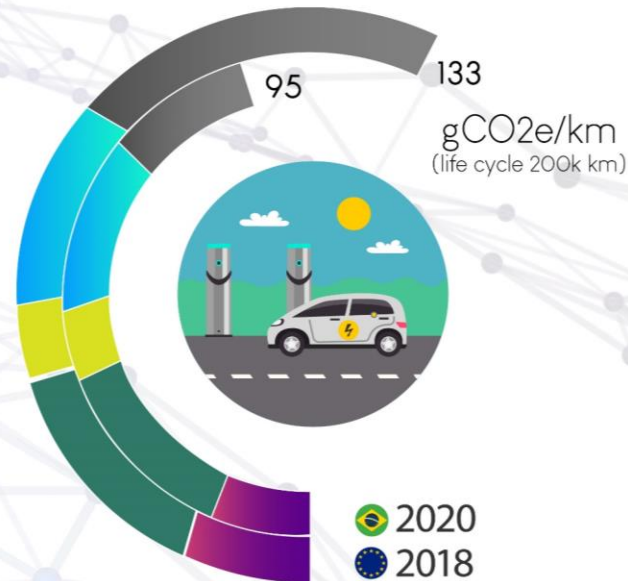
# COMPARATIVE

Ethanol Hybrid vehicles have the lowest life cycle CO2 emissions  
(estimated values)

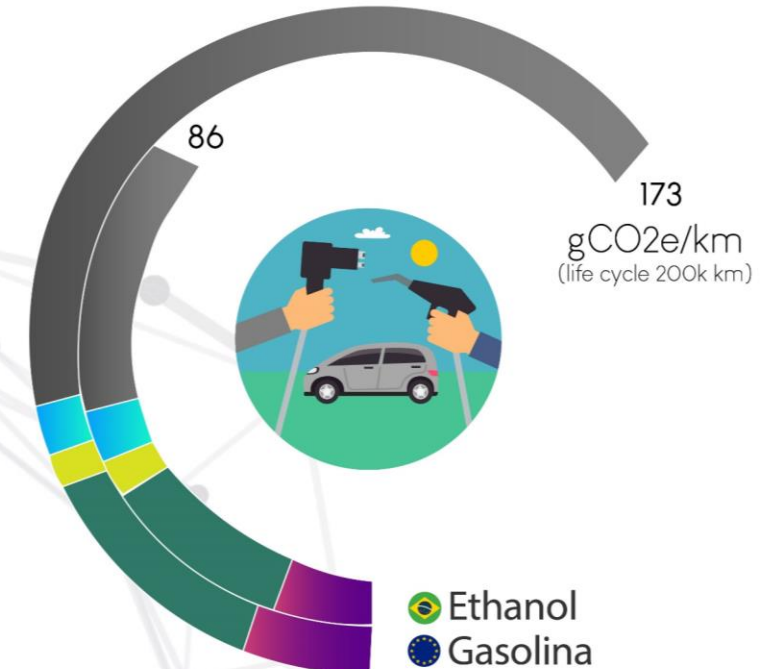
## COMBUSTION VEHICLE



## ELECTRIC VEHICLE

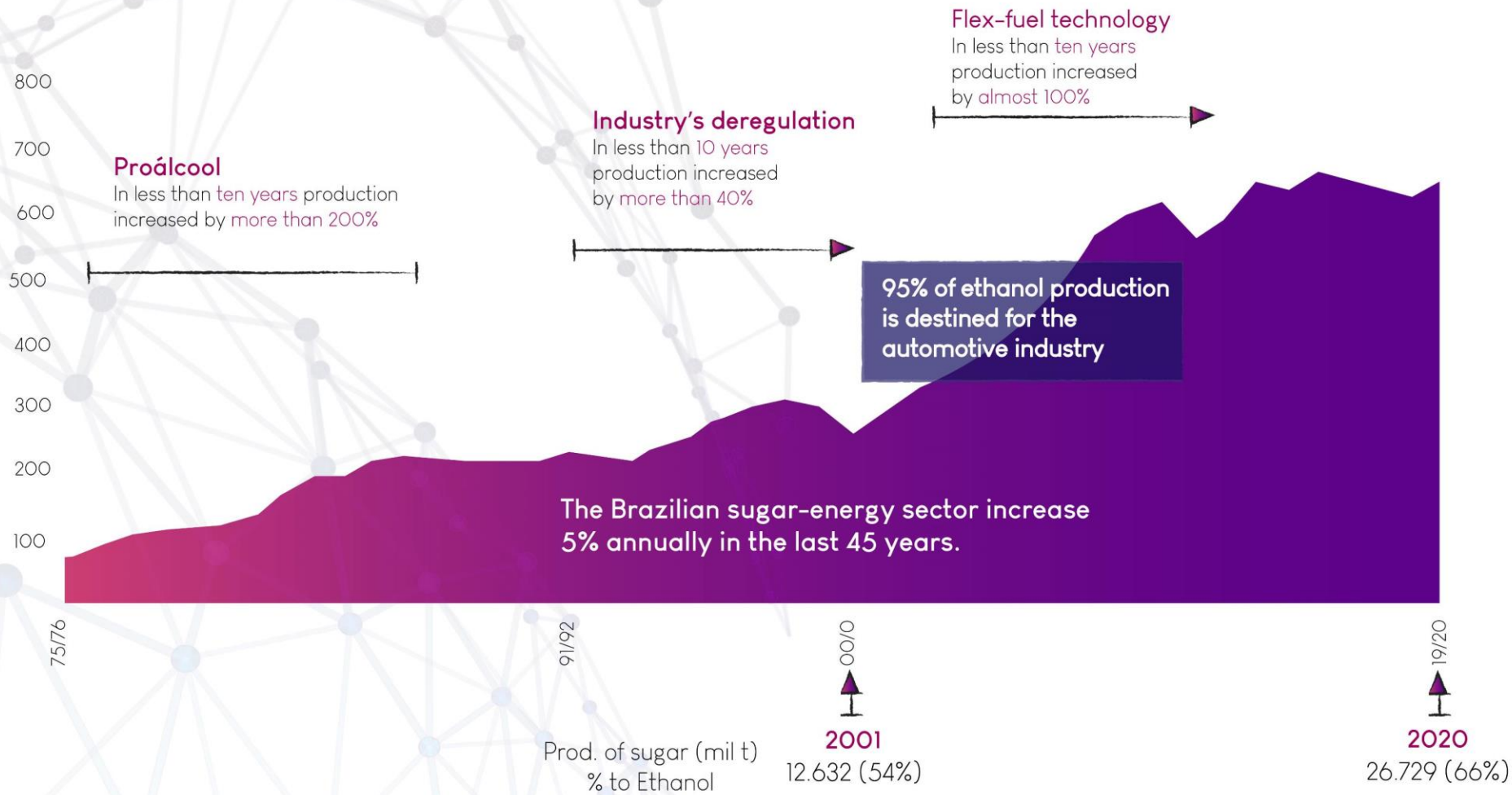


## HYBRID VEHICLE (HEV Prognosis)



Other & Recycling    Supply Chain    Production (in house)    Battery Production    Vehicle Usage

# ETHANOL'S POTENTIAL



## NEXT SECTOR CYCLE

**Public policies:**

- Future Fuel
- RenovaBio
- Energy Matrix

## Evolution of the sugar-energy sector

History of sugarcane milling in Brazil (million tonnes)

Sources: Unica | Copersucar | Volkswagen



# INNOVATION, TECHNOLOGY AND KNOWLEDGE IN THE BRAZILIAN AUTOMOTIVE INDUSTRY

## Volkswagen e-Delivery, primeiro caminhão elétrico brasileiro

Veículo com autonomia de 200 km é apresentado na Alemanha

Por PEDRO KUTNEY, AB  
11/10/2017 - 17:00 | Atualizado há 7 meses, 2 semanas

2 minutos de leitura



## Scania nacionaliza ônibus a biometano e GNV

Modelo começou demonstrações indo de São Bernardo do Campo a Sorocaba

Por REDAÇÃO AB  
08/09/2016 - 17:41 | Atualizado há 7 meses, 2 semanas

2 minutos de leitura



## Embraer fecha a maior encomenda do 'carro voador' para o Brasil

Companhia, por meio de sua subsidiária Eve, já recebeu pedidos para entregar 735 'aeronave' em todo o mundo



## Volkswagen cria centro de pesquisa no Brasil para estudar uso de etanol



# INNOVATION, TECHNOLOGY AND KNOWLEDGE IN THE BRAZILIAN AUTOMOTIVE INDUSTRY

## Fras-le desenvolve pastilha de freio inovadora

Nova pastilha Matrixx da Fras-le: 25% mais leve

Por PEDRO KUTNEY, AB | De Frankfurt (Alemanha)  
22/09/2014 - 09:09 | Atualizado há 7 meses, 2 semanas

1 minuto de leitura

## ZEN é finalista de prêmio de inovação na Automechanika

A Polia OAD da ZEN: exposta em lugar de honra na Automechanika 2014, como uma das três finalistas ao prêmio de inovação da feira na Alemanha.

Por PEDRO KUTNEY, AB | De Frankfurt (Alemanha)  
17/09/2014 - 20:45 | Atualizado há 7 meses, 2 semanas

57 segundos de leitura



## Ioche-Maxion terá roda de liga leve flexível

Inovação foi revelada pela empresa durante comemoração de 100 anos

Por SERGIO QUINTANILHA, PARA AB  
14/08/2018 - 15:42 | Atualizado há 7 meses, 2 semanas

2 minutos de leitura



## WEG desenvolve sistema de tração para o primeiro ônibus elétrico híbrido "Dual" do Brasil

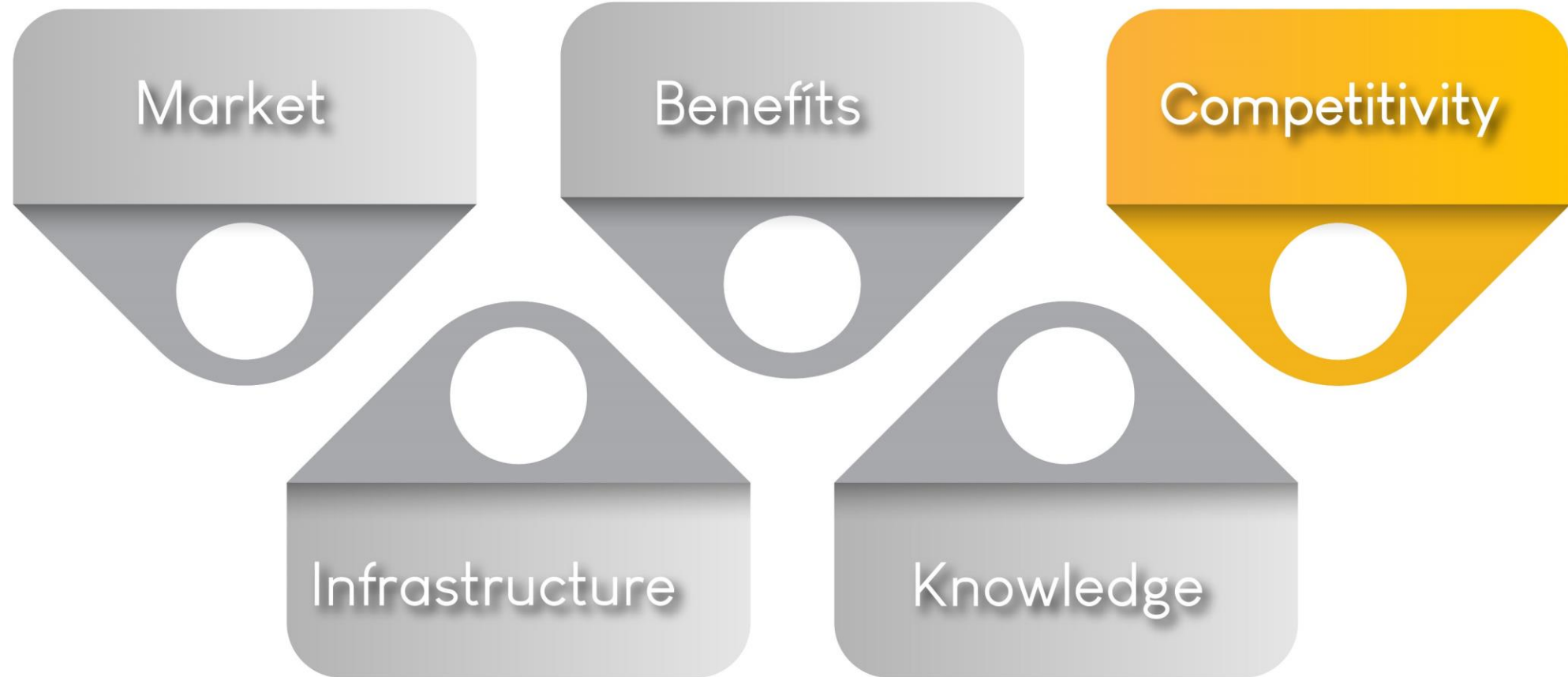
O DualBus pode funcionar em múltiplos modos: Elétrico Puro, Híbrido-série e Trólebus



## Sabó: nanotecnologia para fusão na junta de borracha com alumínio



# WHY INVEST IN RD&I IN BRAZIL'S AUTOMOTIVE VALUE CHAIN







Bioelectricity: our electric matrix is 83% renewable and the energy matrix 45% renewable in 2019 (epe).



Reduction and capture of greenhouse gases - GHG



Program Future Fuel

# COMPETITIVITY

## Brazil Advantages



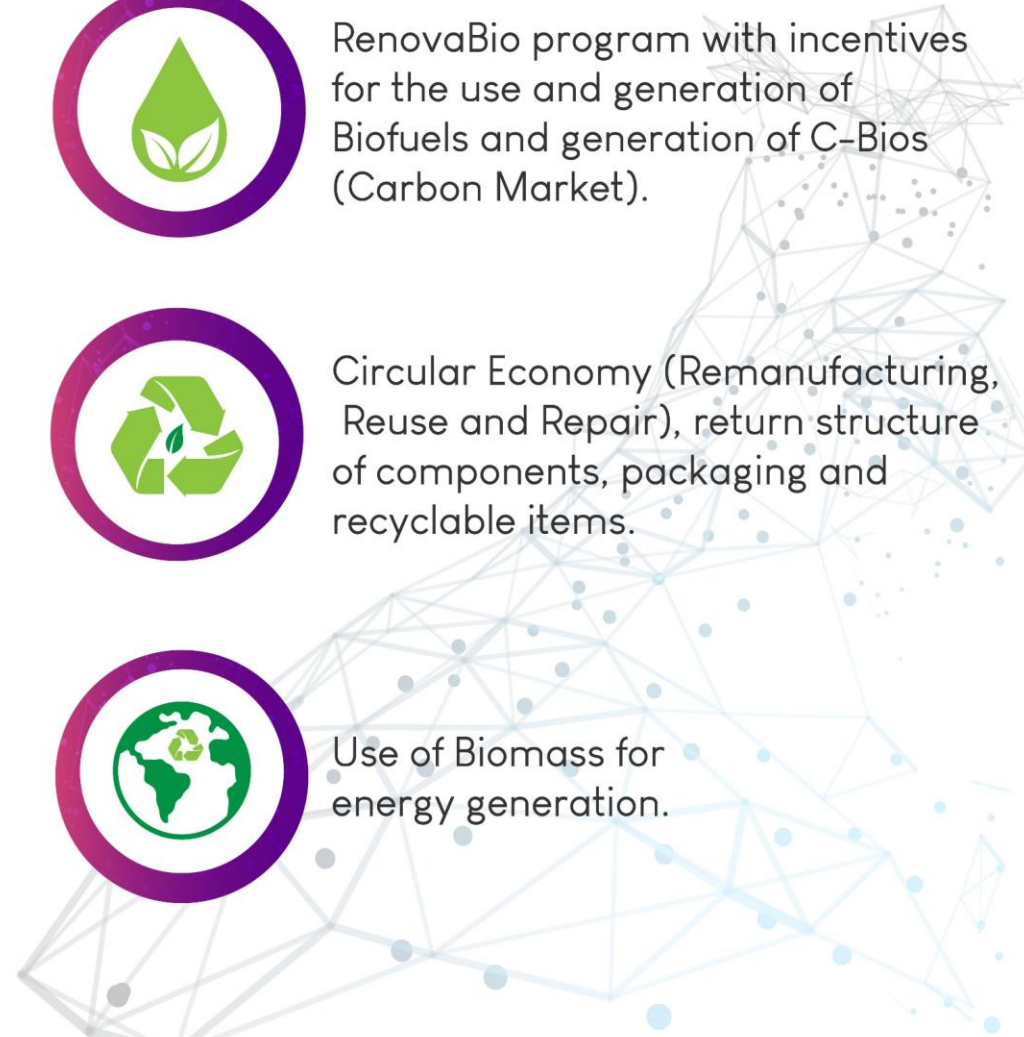
RenovaBio program with incentives for the use and generation of Biofuels and generation of C-Bios (Carbon Market).



Circular Economy (Remanufacturing, Reuse and Repair), return structure of components, packaging and recyclable items.



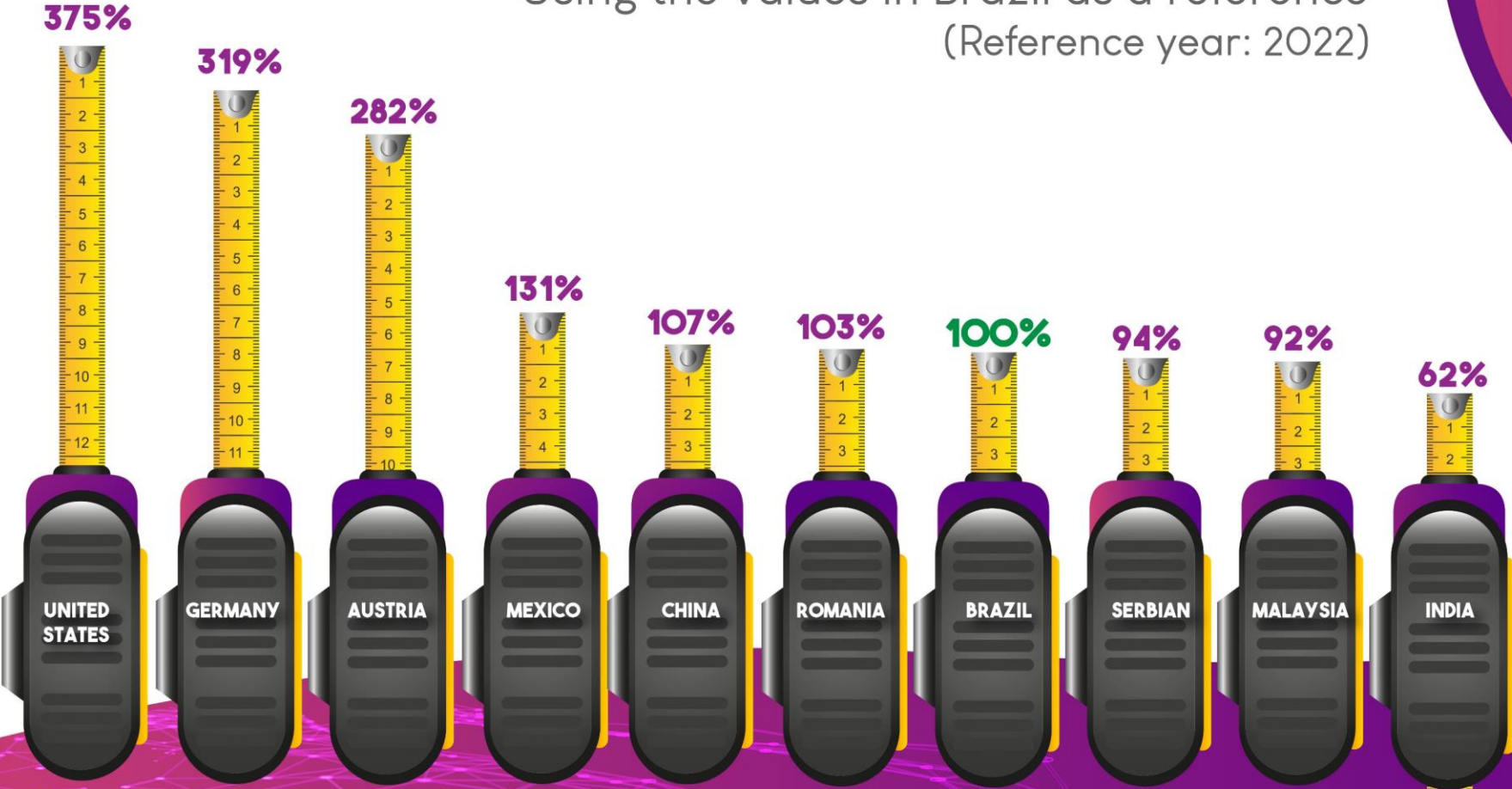
Use of Biomass for energy generation.



# COST OF THE ENGINEERING PROFESSIONAL PROFESSIONAL IN THE INDUSTRY

Using the values in Brazil as a reference (Reference year: 2022)

The cost of an engineer in Brazil is competitive to similar middle-income countries and lower than the most developed ones



Fonte: Informações de multinacional do setor com base em dados oferecidos por suas unidades em diferentes países, 2022



**THANK YOU**

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Idealization,  
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