

# BBEST & IEA Bioenergy Conference 2024 ICARUS Workshop



**JOURNEY TO SUSTAINABILITY: ADVANCES AND INNOVATIONS IN  
FISCHER-TROPSCH SYNTHESIS FOR SAF PRODUCTION**



# Agenda

- 1) Why we need SAF?
- 2) Brazilian initiatives for SAF
- 3) SENAI Innovation Institute for Renewable Energies: A case study into SAF production
- 4) Final remarks

## Developing Sustainable Aviation Fuel (SAF)

We estimate that Sustainable Aviation Fuel aviation to reach net zero CO2 emissions by demand. The largest acceleration is expected with fossil kerosene, and credible offsets by

Government policy has an instrumental role and industries, while being technology and stages of market development, mandates complemented with incentive programs that

### How does SAF reduce the aviation industry's carbon footprint?

## Taking flight with sustainable aviation fuel: Benefits and considerations

February 27, 2024

Sustainable aviation fuel (SAF) offers a significant reduction in lifecycle carbon emissions — up to 80% compared to traditional jet fuel, while also leading to cleaner air, being compatible with existing aircrafts, and creating economic opportunities.

Aviation is crucial for global transportation, connecting people and goods across vast distances. However, its environmental impact — particularly its carbon footprint — has become a significant concern in the face of climate change. As the sector works towards decarbonization, sustainable aviation fuel (SAF) will be key to achieving net-zero emissions by 2050.



Need Help?

 [Contact us](#)

# Brazilian Initiatives – Government

## EPE Launches the Fact Sheet on Sustainable Aviation

### Brasil inaugura primeira planta piloto para produzir combustível sustentável de aviação; infraestrutura foi instalada no RN

The **Fact Sheet on Sustainable Aviation** overview and fundamental concepts, in from 2027 onwards. the country should indicates the impact achieve, in the future in Brazil, the production actions related to

[Página Inicial](#) > [Notícia](#)

Plenário

### Senado aprova "Futuro"

O Senado aprovou sustentável para a aumenta a mistura será de 27%, com de etanol. O texto v

5/09/2023 18h40



[Curtir 0](#)



Laboratório foi inaugurado nesta quarta-feira pelo Instituto SENAI de Inovação em Energias Renováveis (ISI-ER) em parceria com a Cooperação Brasil-Alemanha para o Desenvolvimento Sustentável | Foto: Alex Régis / Ágil Fotografia

ces sustainable aviation

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# Brazilian Initiatives – University

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PROJETO

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SIGAA - UFPB

Sistema Integrado de Gestão de Atividades Acadêmicas



PROGRAMA DE PÓS-GRADUAÇÃO EM DESENVOLVIMENTO E  
MEIO AMBIENTE (PRODEMA - MEST)



Atividades



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Início / Arquivos / v. 7 n. 4 (2021) / Artigos originais

## Uso dos coprodutos da indústria do biodiesel para produção de bioquerosene de aviação / Use of biodiesel industry co-products for the aviation biokerosene production

Sérgio Peres

Brazilian Journals Publicações de Periódicos, São José dos Pinhais, Paraná

Ana Rita Fraga Drummond

Eduardo César de Miranda Loureiro

Maria de Los Angeles Perez Fernandez Palha



Publicado

2021-04-09

# Brazilian Initiatives – Industry



Pesquisar

Boeing no Brasil e América Latina Produtos e Serviços Sobre a Boeing Inovação Notícias Sustentabilidade Carreiras Multimídia

COMBUSTÍVEIS SUSTENTÁVEIS DE AVIAÇÃO COMBUSTÍVEL SUSTENTÁVEL DE AVIAÇÃO ENERGIA RENOVÁVEL

SUSTENTABILIDADE > PRODUTOS SUS

Início > Combustíveis e Bioenergia > Biocombustíveis

## Biocombustíveis

# Embraer e Raízen firmam acordo para produção de

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23/05/2024

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Biocombustíveis

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Página inicial Sobre o Cenpes

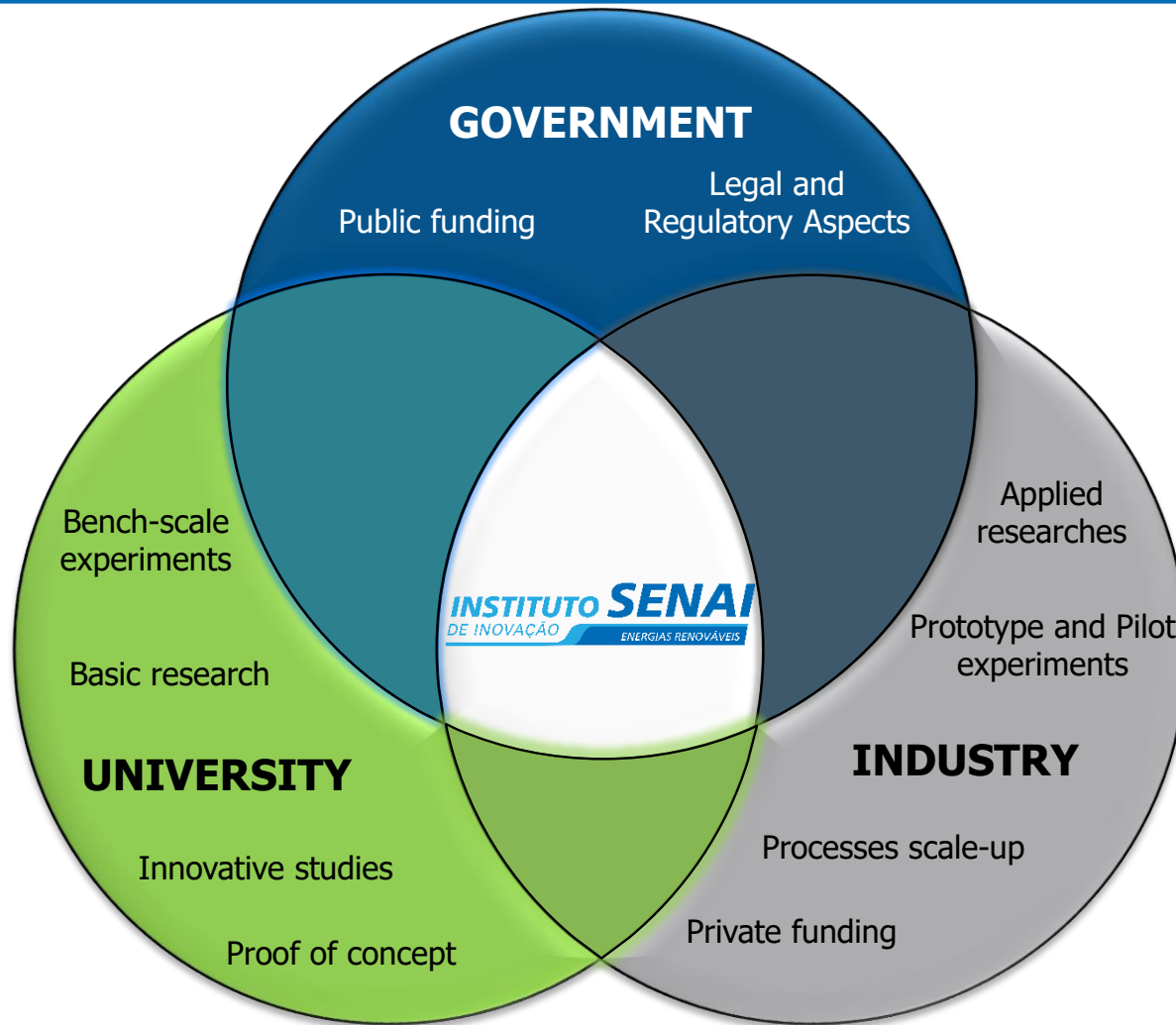
Imaginar, criar e fazer  
hoje o futuro da Petrobras

Oportunidades

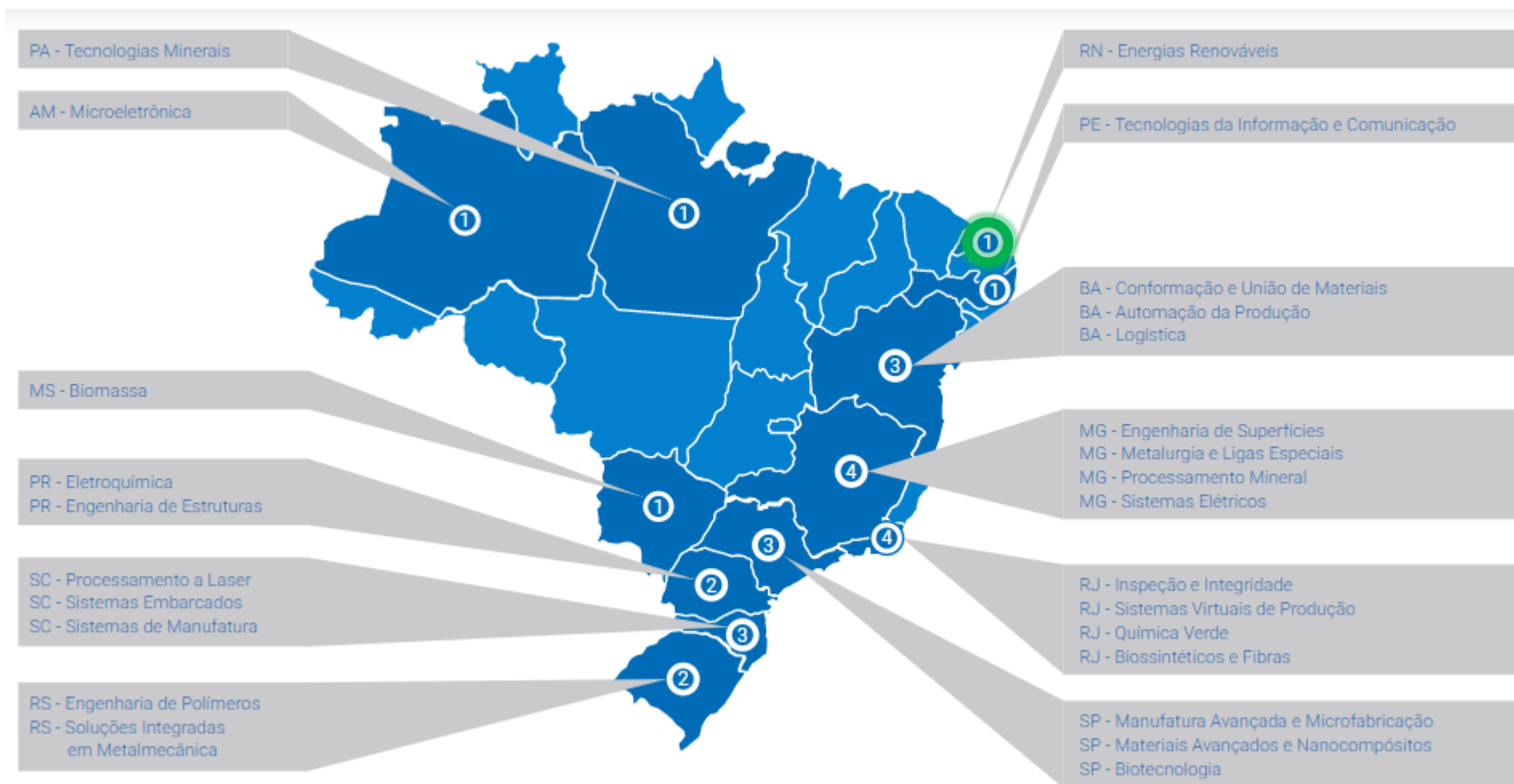
OP2419 - Avaliação da tecnologia de gaseificação em fluxo de arraste para produção de SAF



# Brazilian Initiatives



# SENAI Innovation Institute Networking

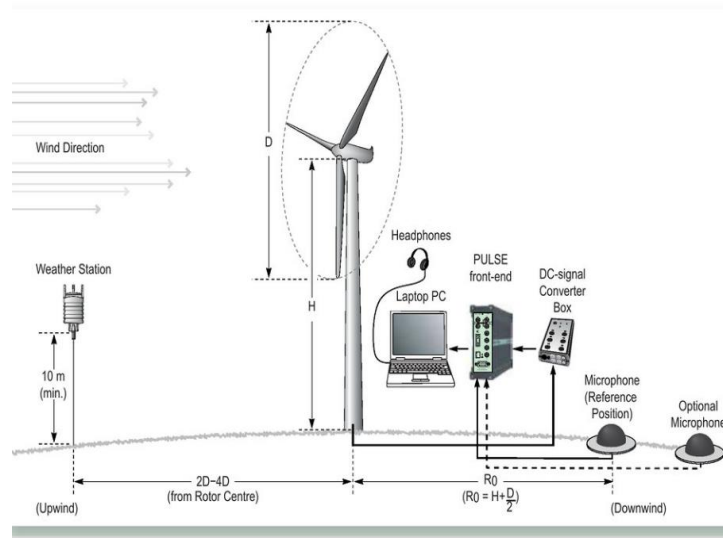


Fonte: <http://institutos.senai.br/>

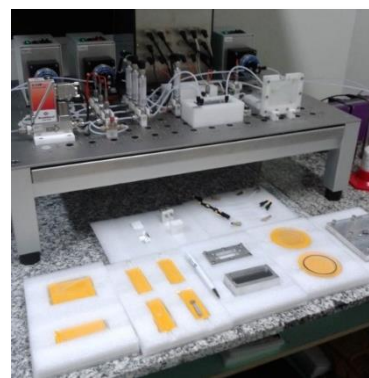


# SENAI Innovation Institute for Renewable Energies ISI-ER



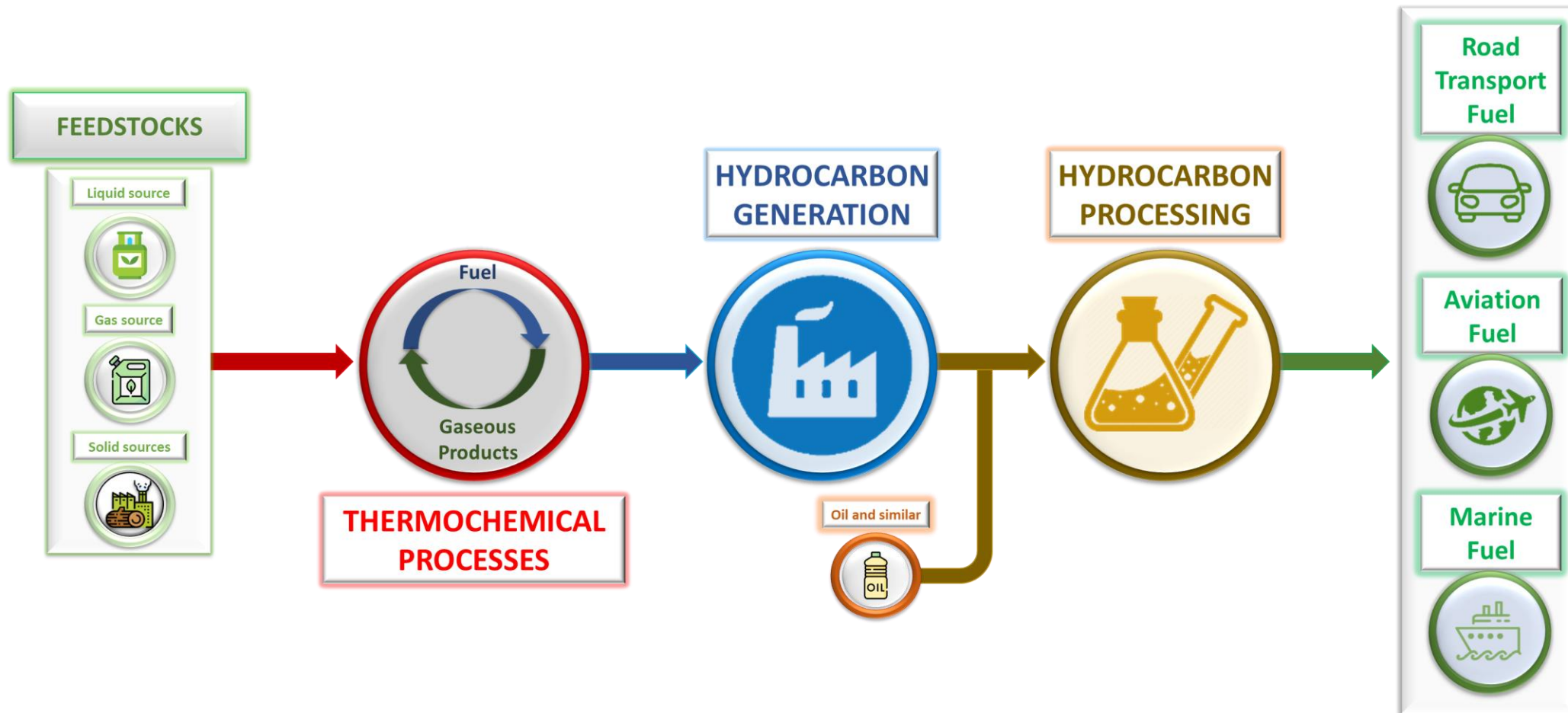


- Wind Energy: Onshore and Offshore sites
- Solar Energy: Thermal and Photovoltaic
- Sustainability
  - Environmental
  - Advanced Fuels
  - Low Carbon Hydrogen
  - Greenhouse Gases (mainly CCUS)





# Researches carried at the ISI-ER Sustainability Laboratory



# ISI-ER Sustainability Lab

## Main infrastructure for SAF production



Experimental Plant for SAF production



# ISI-ER Sustainability Lab

## Main infrastructure for SAF production



### Experimental Unit for Oil Hydrotreatment



Cooperation between ISI-ER and an international institute



Hydrocracking, Hydroisomerization and other Hydroprocesses can be carried



Automatized System

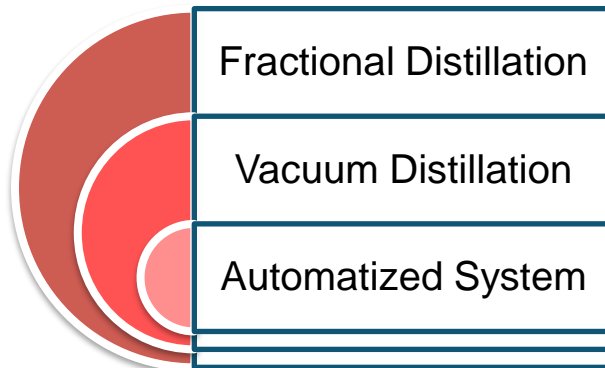


# ISI-ER Sustainability Lab

## Main infrastructure for SAF production



### Distillation Unit – Separation of Renewable Hydrocarbon





# ISI-ER Sustainability Lab

## Supplementary infrastructure for SAF production

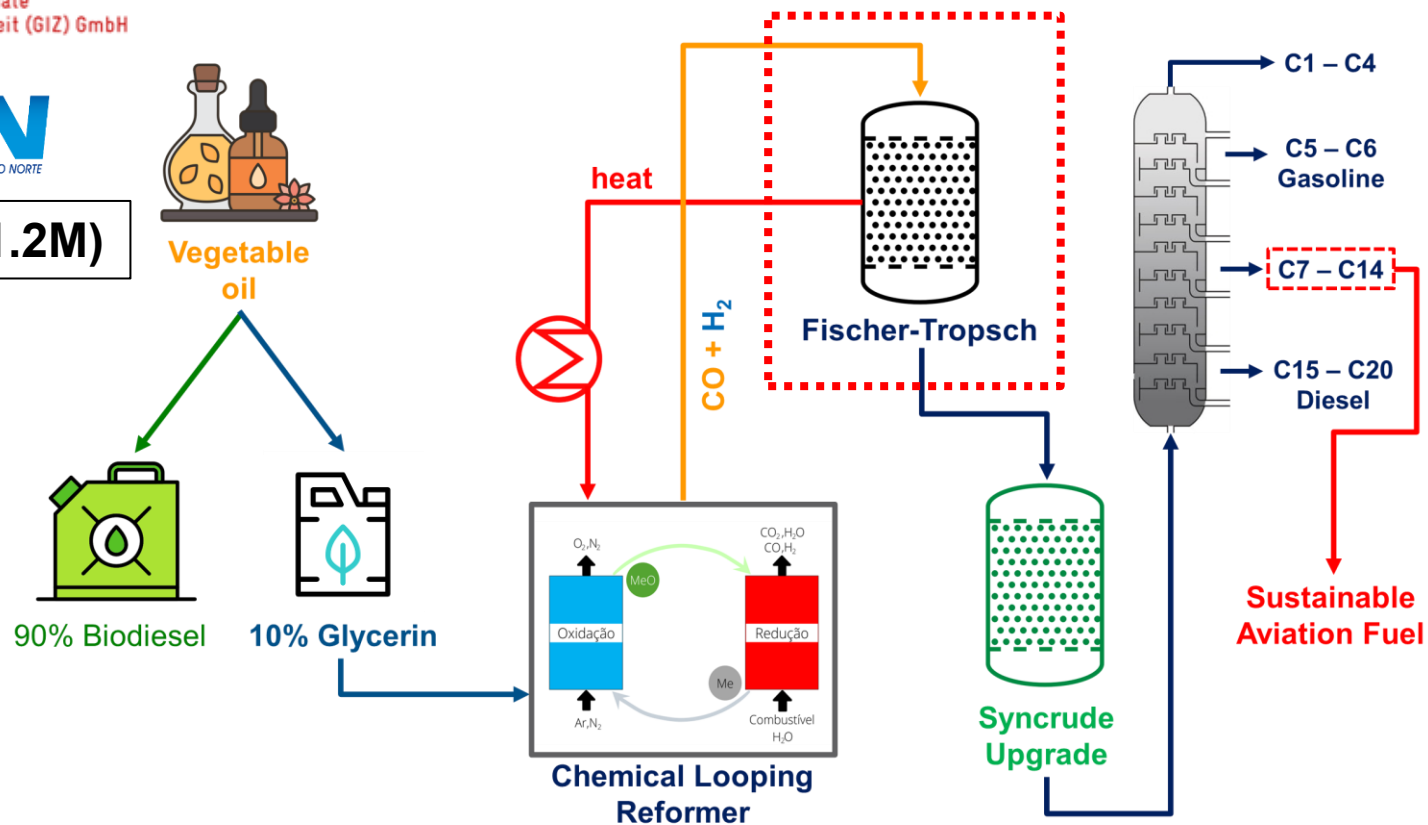


# Production of SAF from Glycerin Feedstock using CL, FT and Upgrading (2021 – 2023) ✓

**giz** Deutsche Gesellschaft  
für Internationale  
Zusammenarbeit (GIZ) GmbH

**UFERN**  
UNIVERSIDADE FEDERAL DO RIO GRANDE DO NORTE

≈R\$7.0M (€1.2M)

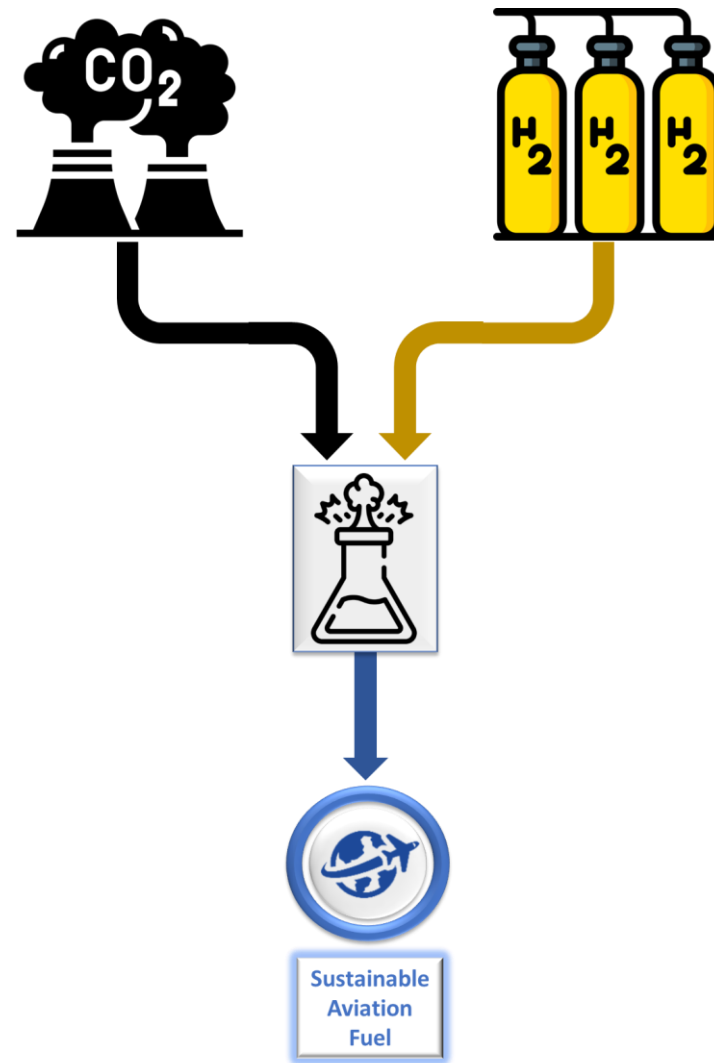


# Production of SAF using Green Hydrogen, Captured CO<sub>2</sub>, FT and Upgrading (2023 – 2025) ⚙️



Petrogal Brasil S.A.  
Joint Venture Galp | Sinopec

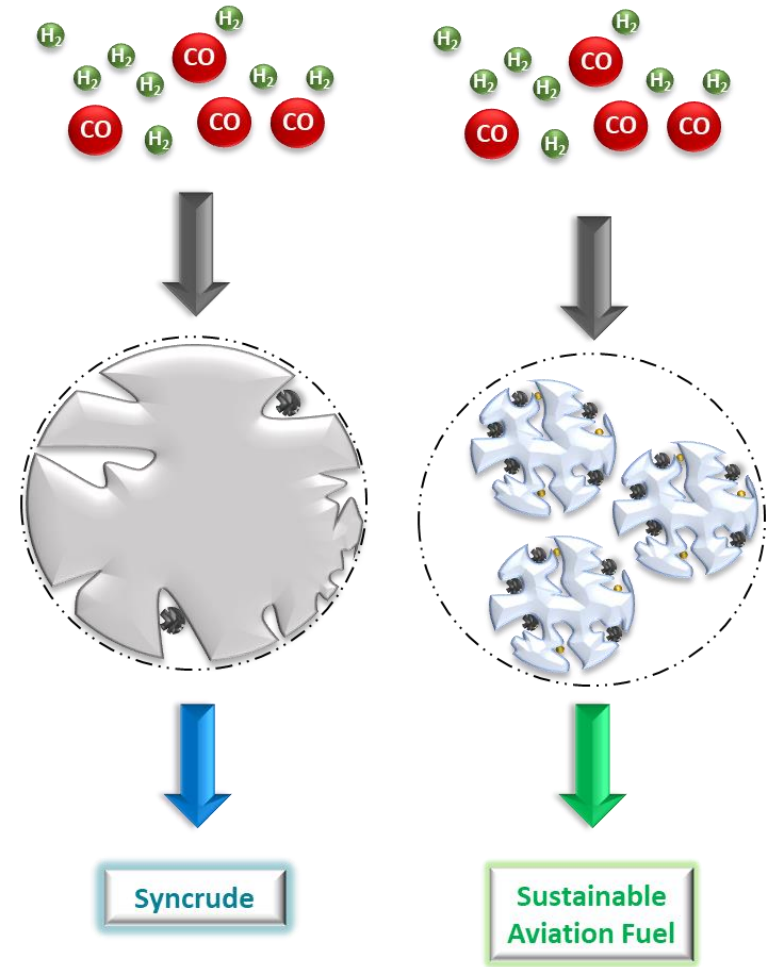
≈R\$10.0M (€1.7M)



## Main Activities

### WP2: Innovations in SAF technologies in Europe and MIC

- Catalyst development
- Continuous tests through the fixed-bed FT route





# ISI-ER in the news – Contributions to the SAF knowledge

Forbes

## Brasil inova combustíveis

Ministério da Minas e Energia

O laboratório, que transformado em

MME para produção

Um dos principais transportes aéreos

Publicado em 05/0

Forbes  
AGRO

Reuters



O Ministério de M  
É a primeira plant



Amostra de combustível sustentável de aviação (SAF) em desenvolvimento no Instituto SENAI de Inovação em Energias Renováveis (ISER) | Foto: Renata Moura

Apresentado por

DEFENDER

uzido a partir matérias-  
combustíveis.

que são as nossas  
desse Brasil. (...)

Precisamos tomar decisões rápidas e nós temos o potencial para que isso aconteça", diz Fabiola, pesquisadora do Instituto SENAI de Inovação em Energias Renováveis.

# Final Remarks

- ✓ As the world undergoes the decarbonization of aviation fuel, Brazil arise as one of the potential SAF producers
- ✓ The Government-University-Industry synergy is working together to develop the decarbonization of the aviation sector, with innovation institutes, especially the SENAI Institute for Innovation in Renewable Energy (ISI-ER), applying the basic knowledge developed at the universities to the industry needs
- ✓ ISI-ER is one of the main Brazilian research institutes focused on developing investigations for the scale-up of SAF production, with the Sustainability Lab working on the SAF production from different raw materials based on innovations applied to Fischer-Tropsch synthesis and HEFA
- ✓ The projects carried out by the institute showed that the decarbonization of the aviation sector is not only possible but can also be developed in Brazil thanks to its potential for renewable sources (mainly solar and wind energies and biomasses)



# Contact Info

**THANKS FOR YOUR ATTENTION!**

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