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Strategies to boost the post-pandemic Brazilian Bioeconomy: bilateral research cooperation projects Brazil-Germany

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A série "Comunicação Técnica" compreende trabalhos elaborados por técnicos do IPT, apresentados em eventos, publicados em revistas especializadas ou quando seu conteúdo apresentar relevância pública.



6. The transition to a sustainable bioeconomy



6.7 Contribution of bioeconomy to a sustainable post-corona economy

Strategies to boost the post-pandemic Brazilian Bioeconomy: Bilateral research cooperation projects Brazil-Germany

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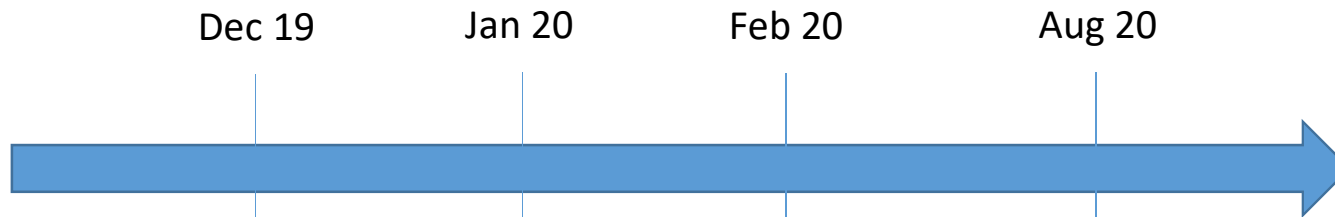
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6.7 Contribution of bioeconomy to a sustainable post-corona economy

COVID-19 Pandemic Evolution



	Dec 19	Jan 20	Feb 20	Aug 20
Case:	1 st case/ 44 cases	11200	79300	85022
Victims:	-	213	2835	4634



	Dec 19	Jan 20	Feb 20	Aug 20
Case:	-	-	1 st case	3,8 million
Victims:	-	-	-	120000

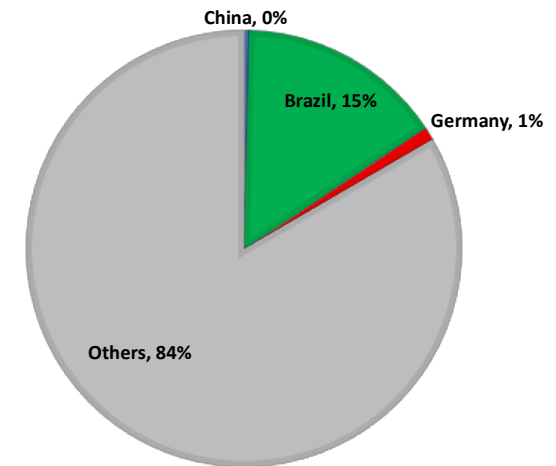


	Dec 19	Jan 20	Feb 20	Aug 20
Case:	-	1 st case	66	242000
Victims:	-	-	-	9000



	Dec 19	Jan 20	Feb 20	Aug 20
Case:	1 st case	9826	85403	24,8 million
Victims:	-	43	2923	840,677

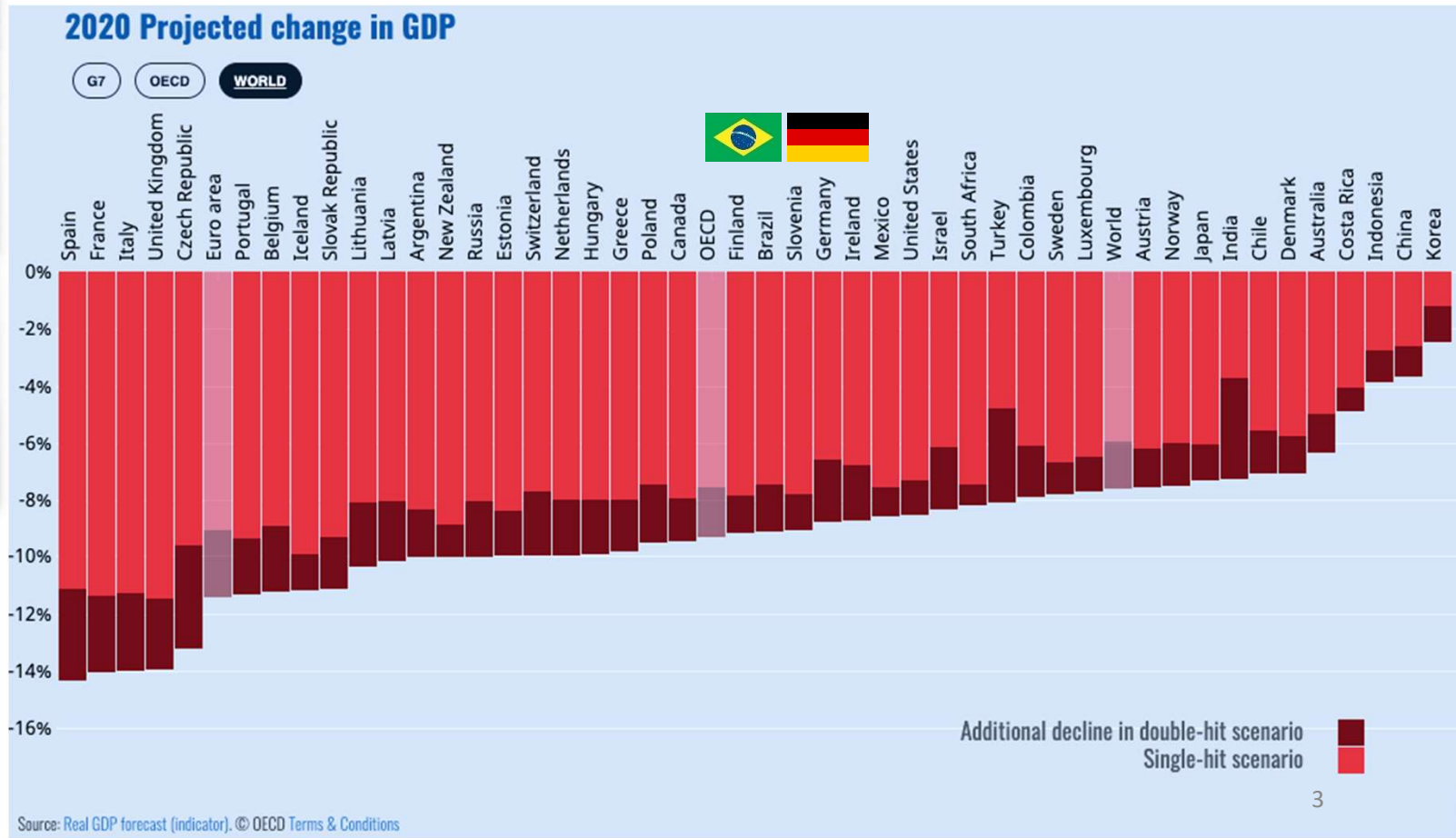
WORLD COVID-19 CASES DISTRIBUTION





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COVID-19 and the ECONOMIC IMPACT





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How to avoid new pandemics in the future?



Wildlife trafficking
and wildlife markets



Habitat destruction

Climate Change



Unsustainable
farming

During the UNESCO's webinar on 17th June 2020, to celebrate the World Environment Day the key message was:

**Protect the environment,
prevent pandemics, 'nature
is sending us a clear
message'.**



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How to recover the economic scenario avoiding new pandemics in the future? **Green economy!**

New normal: Shouldn't we rethink how we produce and consume?

"This new normal requires us to rethink how we produce and consume. Green growth will become a significant driver of shared recovery."

Li Young General-director UNIDO.

- Stopping global economies has made governments think about recovery with a green agenda;
- Opportunity to take meaningful action on climate change supporting the sustainable management of landscapes that enhance sustainable coexistence of agriculture and wildlife.

BIOECONOMY:

"The **bioeconomy** is the knowledge-based production and use of biological resources to provide products, processes and services in all economic sectors within the frame of a sustainable economic system."

Bioeconomy BW





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Bioeconomy Strategy: Brazil and Germany



Brazilian National strategy on Science, Technology and Innovation 2016-2022

Bioeconomy: Strategic area for the Brazilian techno-scientific development

1. International cooperation with leading countries and its institutions;
2. Development of research projects for innovative solutions for sustainable use of Brazilian biodiversity;
3. Mitigation of the climate change;
4. Energetic efficiency are some of the priorities targeted;



German National Bioeconomy Strategy

Align the bioeconomy with the sustainable development goals (SDGs) of the United Nation's 2030 Agenda

1. Develop bioeconomy solutions for the sustainability agenda;
2. Recognise and harness the potential of the bioeconomy within ecological boundaries;
3. Enhance and apply biological knowledge;
4. Provide a sustainable raw material base for industry;
5. Promote Germany as the leading location for innovation in the bioeconomy
6. Involve society in the bioeconomy and intensify national and international collaboration;

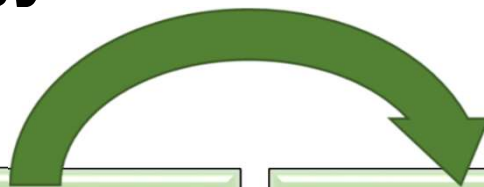


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Bioeconomy Strategy: Brazil and Germany



**COVID-19 RECOVERY STRATEGY:
BIOFUTURE PLATFORM**



**COVID-19 RECOVERY STRATEGY:
INVESTMENT IN GREEN SECTOR**

Five principles for post –COVID Bioeconomy recovery:

- 1) **Do not backtrack:** Ensure continuity and long-term predictability of bioenergy, biofuels, bio-based material and policy mechanisms;
- 2) **Consider short-term COVID support for producers:** Address short-term challenges for bioenergy and bio-based materials industries in the context of relief packages related to COVID-driven economic losses;
- 4) **Build Back Better with Bio:** Integrate the bioeconomy as part of recovery programmes, e.g. by requiring bioeconomy investments/targets as part of aid and recovery packages for specific sectors such as transport and chemicals;
- 5) **Reward sustainability:** Integrate sustainability rewarding mechanisms into policy frameworks, promoting positive externalities in the production and use of bio-based fuels, chemicals and materials.

As part of its 130 billion euro recovery budget, Germany has allocated some 50 billion euro to sustainable investments in areas like renewable power and electric vehicles.

Measures will be taken in areas that are crucial for future growth and sustainability. Energy transition and compliance with climate targets are two of the main areas.



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SCIENTIFIC PROJECTS BRAZIL-GERMANY

Overall objective:

Development of biomass conversion route, using residual biomass abundant in Brazil for production of chemicals and fuels;

Three Brazilian partners:

- Institute for Technological Research (IPT) – leading institute in **biomass characterization**;
- Engineering School of Lorena – leading institute in **biotechnological conversion routes** of biomass;
- Federal University of Sergipe – leading institute in **advanced characterization techniques of liquid products**;

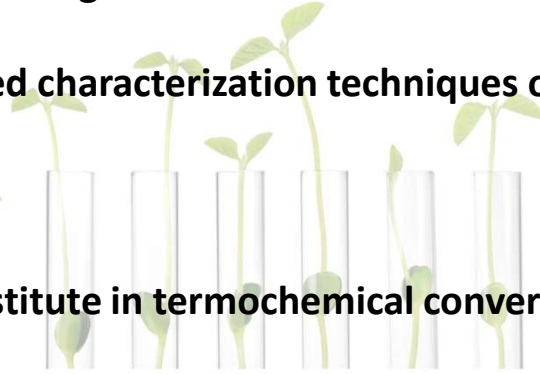
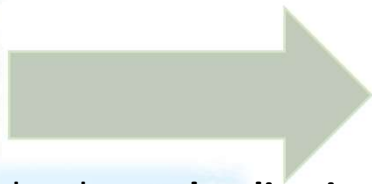


German Institute:

- Institute of Catalysis research and technology – **leading institute in thermochemical conversion of biomass and catalytic upgrading of liquid fuels**;



Residual Biomass



Biobased fuels and chemicals



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SCIENTIFIC PROJECTS BRAZIL-GERMANY

Engineering School of Lorena (BR) and Karlsruhe Institute of Technology

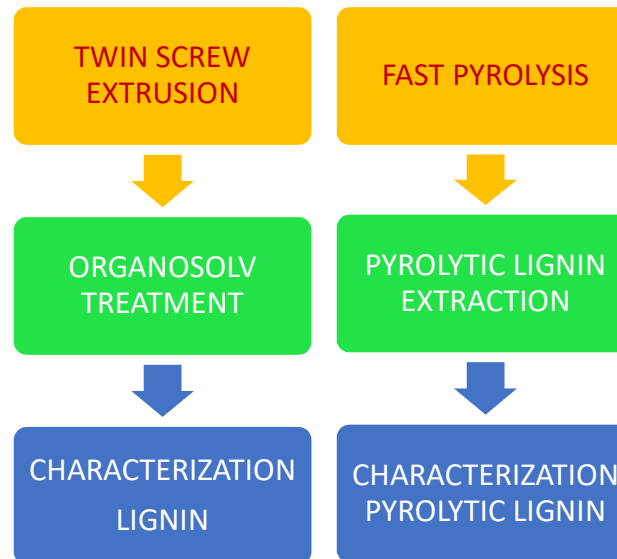
Preparation, characterization and conversion of organosolv lignin and pyrolytic lignin for phenolic monomers production



- Br 3rd largest corn producer in the world;
- 2009/2010: 53,2 million tons of corn; 122,36 million tons of residues;



CORN COB



GOAL:

- Evaluate and differences in the lignin structure after undergoing different conversion process;
- Evaluate further depolymerization of both lignin (organosolv and pyrolytic)

DURATION:

- 3 years project: 2020-2023



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SCIENTIFIC PROJECTS BRAZIL-GERMANY

Federal University of Sergipe (BR) and Karlsruhe Institute of Technology

Evaluation of thermochemical conversion routes for conversion of pyrolytic lignin extracted from beech wood fast pyrolysis bio-oil

GOAL:

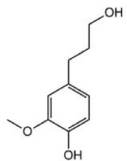
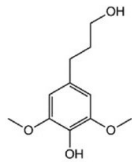
- Evaluate different thermochemical and thermocatalytic conversion routes for pyrolytic lignin for phenolic monomers production

DURATION:

- 4 years project: 2020-2024



BEECH WOOD



BEECH WOOD FAST
PYROLYSIS BIO-OIL

H₂O extraction

Pyrolytic Lignin



Hydroheatment

Hydrothermal
Liquefaction



Deep Characterization

Catalytic Pyrolysis



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SCIENTIFIC PROJECTS BRAZIL-GERMANY

Institute for Technological Research (IPT) and Karlsruhe Institute of Technology

Integration 2G thermochemical conversion routes for sugarcane biorefinery



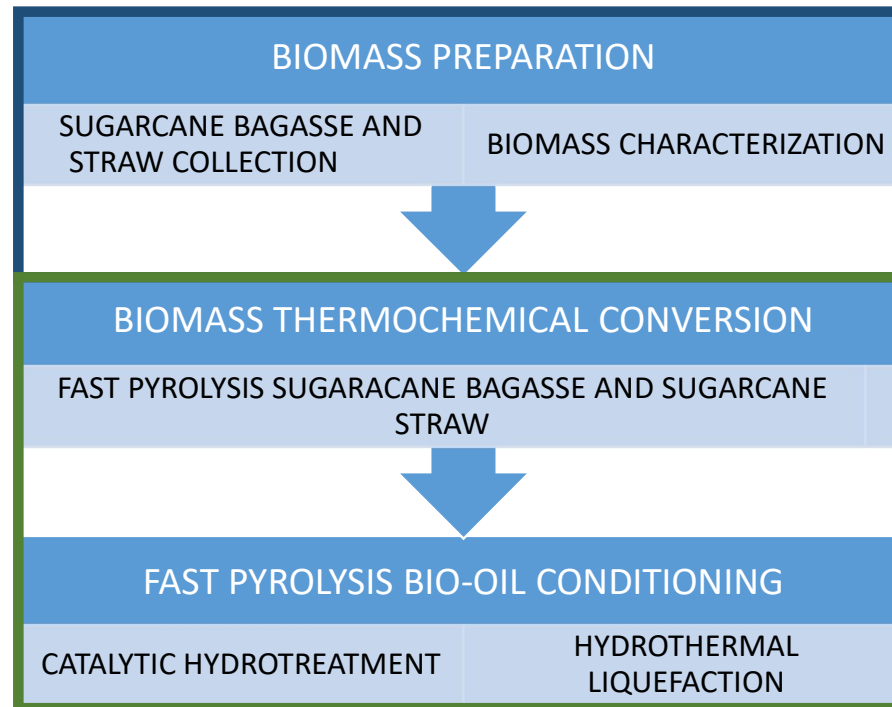
- Brazil biggest producer of sugarcane worldwide
- 635,31 million tons 2018/2019;
- 448 million tons bagasse 2018/2019

GOAL:

- Conversion of sugarcane bagasse and sugarcane straw via thermochemical conversion routes aiming 2G thermochemical conversion route integration.

DURATION:

- 4 years project: 2020-2024

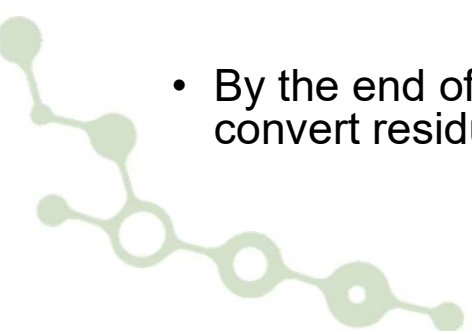




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OVERALL GOAL AND CONCLUSIONS

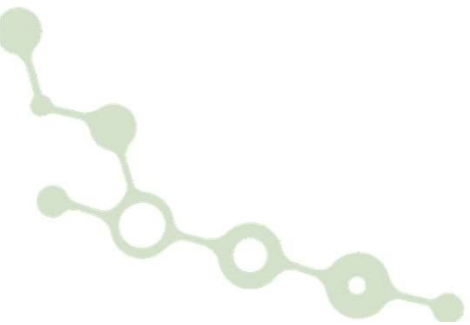
- COVID-19 impacted all countries worldwide;
- Green agenda to recover the economies;
- Bilateral scientific cooperation projects are mentioned in the Bioeconomy strategy of both Brazil and Germany and can be considered a key driver to minimize the COVID economic impact;
- 3 cooperation agreements have been established by KIT and 3 brazilian institutes aiming the valorization of residual biomass via thermochemical and biotechnological conversion routes;
- By the end of the cooperation projects it is expected to develop a conversion route able to convert residual biomass into profitable biobased fuels and biobased chemicals;





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THANK YOU!





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