



RenovaBio: THE CCS MACHINE

Miguel Ivan Lacerda de Oliveira

Biofuels Department

Ministry of Mines and Energy

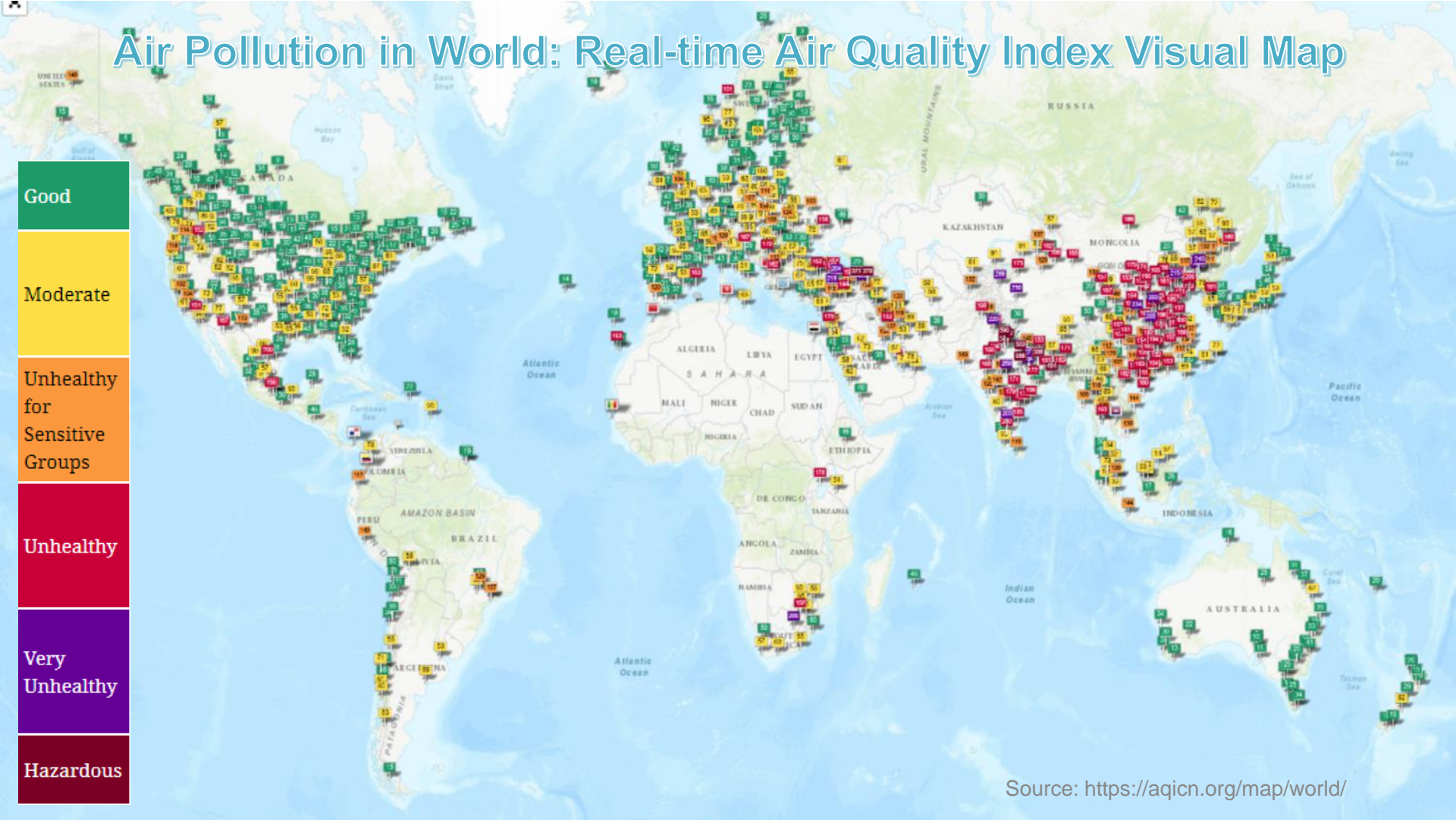
miguel.oliveira@mme.gov.br

MINISTÉRIO DE
MINAS E ENERGIA



We have a problem...

Air Pollution in World: Real-time Air Quality Index Visual Map

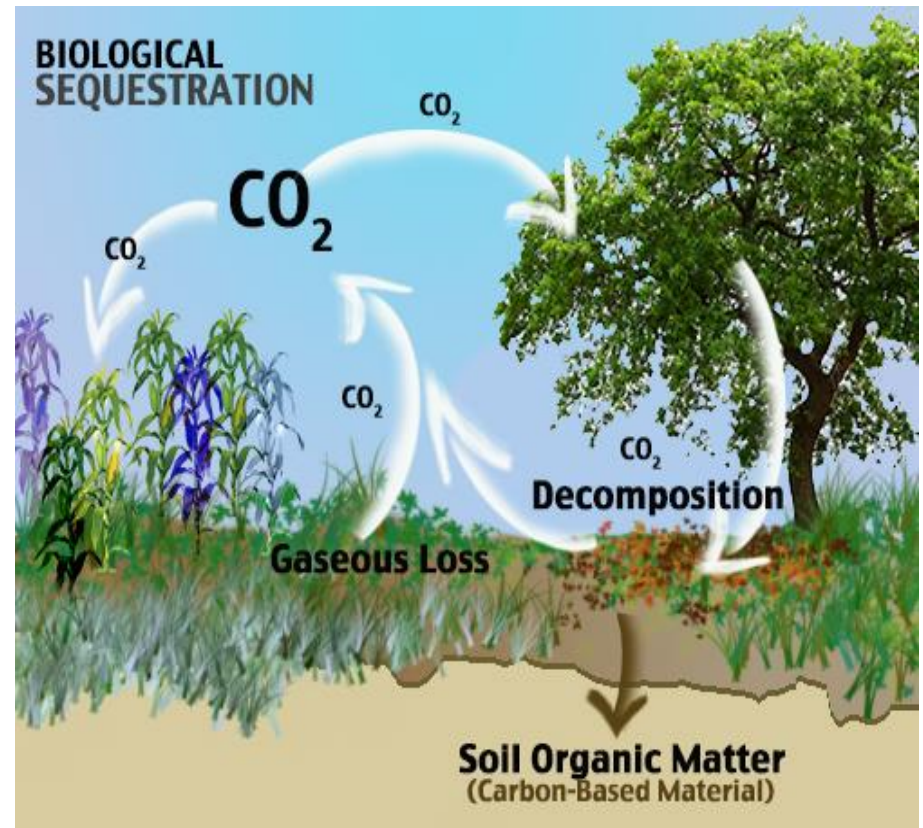
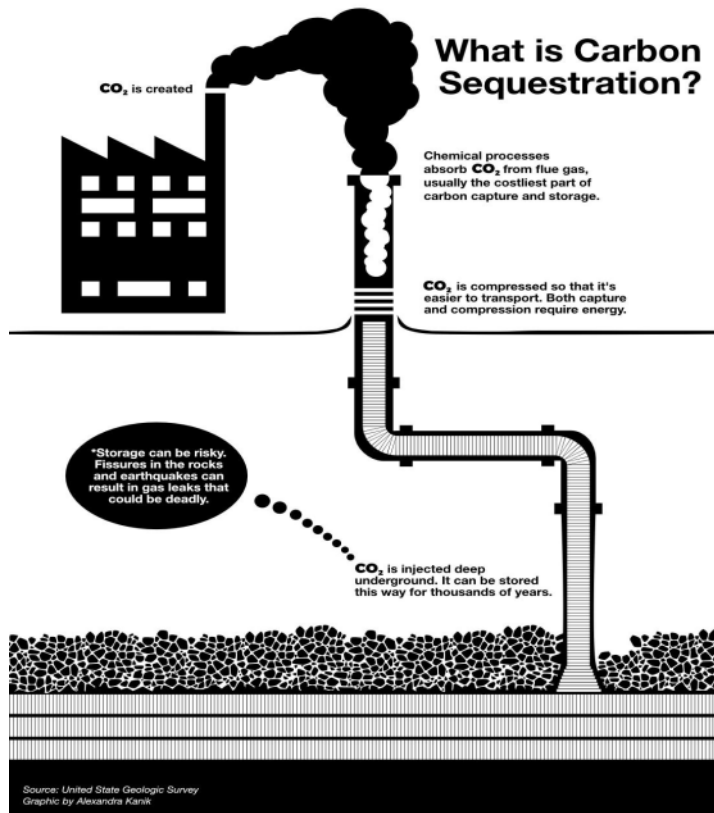


Source: <https://aqicn.org/map/world/>

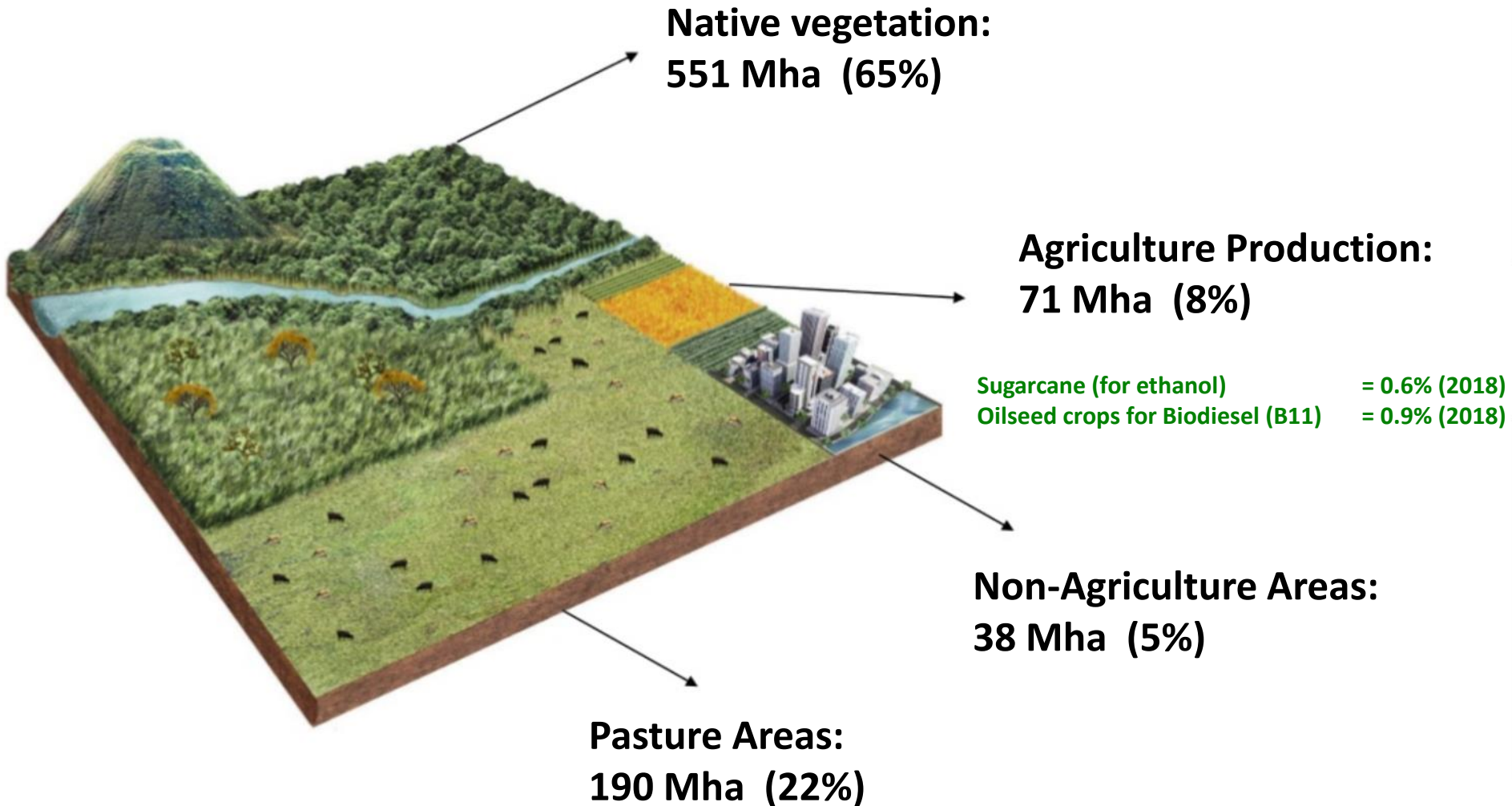
World needs carbon sequestration...

- **“TOTAL announced \$ 400 million fund focused on carbon offset initiatives: TOTAL CARBON NEUTRALITY VENTURES (TCNV) seeks startups around the world in areas such as smart energy, energy storage, smart mobility, bioplastics and recycling.”**
- ✓ **“Global carbon market negotiations are running out of (over)time”**
- **“Brazil and EU face off over future of carbon trading: The generation of carbon markets could make or break the Paris Agreement, say negotiators as talks resume in Bonn...”**
- **“...The scheme has generated more than 1.9 billion CERs and counts more than 8,100 projects and programs across 111 countries. Projects such as [coal-fired plants in India and China](#) and [dams in Guatemala](#) have been tarnished by human rights abuses. More systematically, the mechanism has been criticized for funding projects that would have happened anyway: a [2016 report](#) commissioned by the EU concluded 85% of offsets had a “low likelihood” of driving emission cuts....”**

...the fact is: we can do it safely and sustainably



Land Use in Brazil



Complimentary solutions for necessary changes

CHANGES

FUEL

PLATFORM

CONSUMPTION



Less Fossils
More Bio



Flex Hybrid Vehicles
on more efficient
platforms



Car
Sharing

So, what to do then?

**Emission
assessment**
“from cradle
to grave”

Induce the
best
possible
efficiency
standard

**Signal to
market** players
and the
automotive
industry what
the energy
source there
will be for the
medium and
long term



Transforming the problem into a solution

Dialog with society and Stakeholders

PROBLEM

- Lack of predictability to economic agents
- Decarbonizing the fuel matrix
- Contribute to the security of domestic fuel supply by encouraging biofuels production and use
- High domestic prices

SOLUTION

- Market driven incentive mechanisms
- Coase Market for pricing externalities
- Transfer the costs (social/ environmental) of using fossil fuels as an income to the production of biofuels
- Efficiency incentives to its sustainable expansion

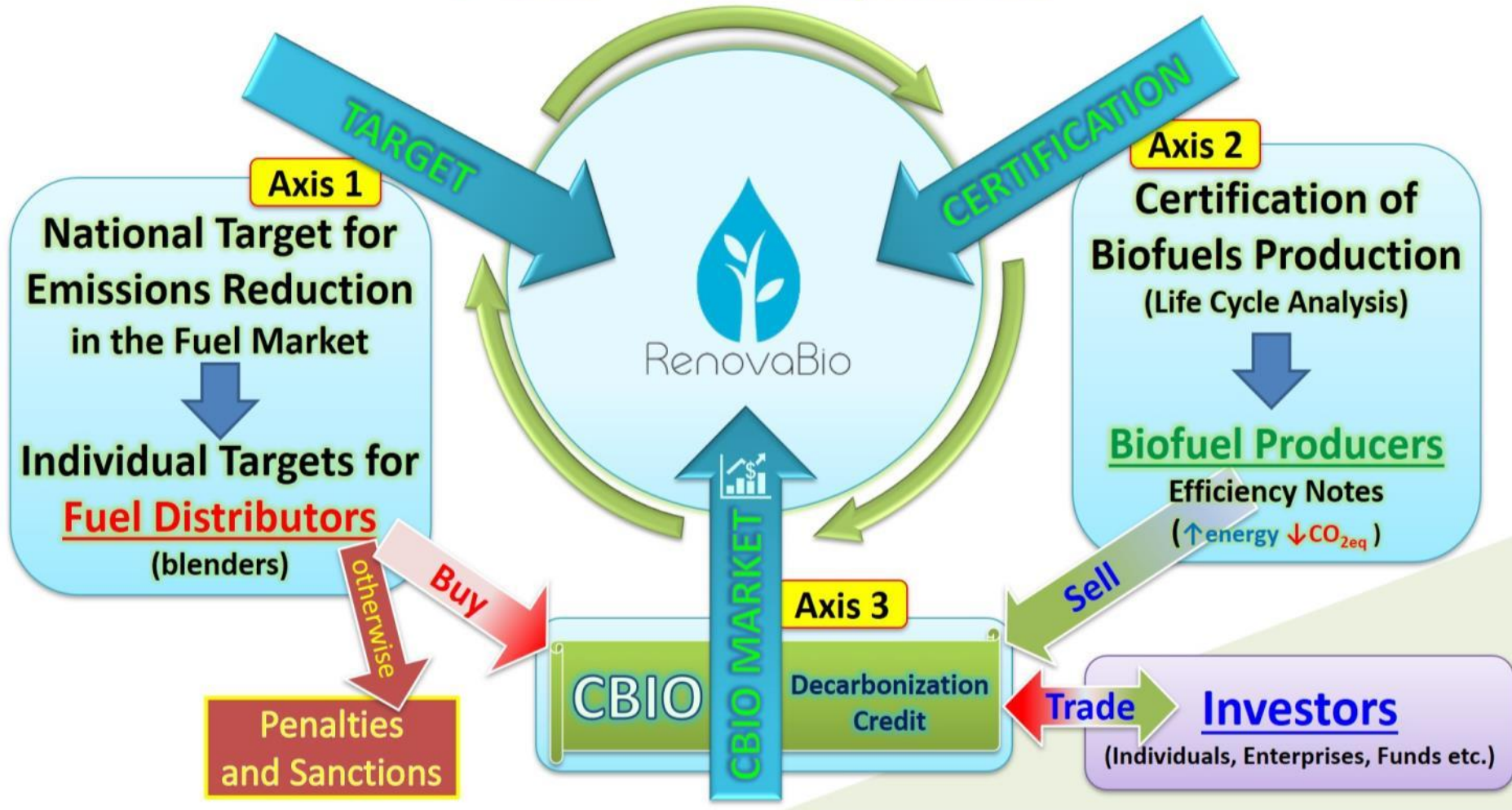


RenovaBio

The New
Brazilian
Biofuels
Policy

RenovaBio Concept: 3 Axes

1 CBIO = 1 ton CO₂ avoided



RenovaBio: What is it?

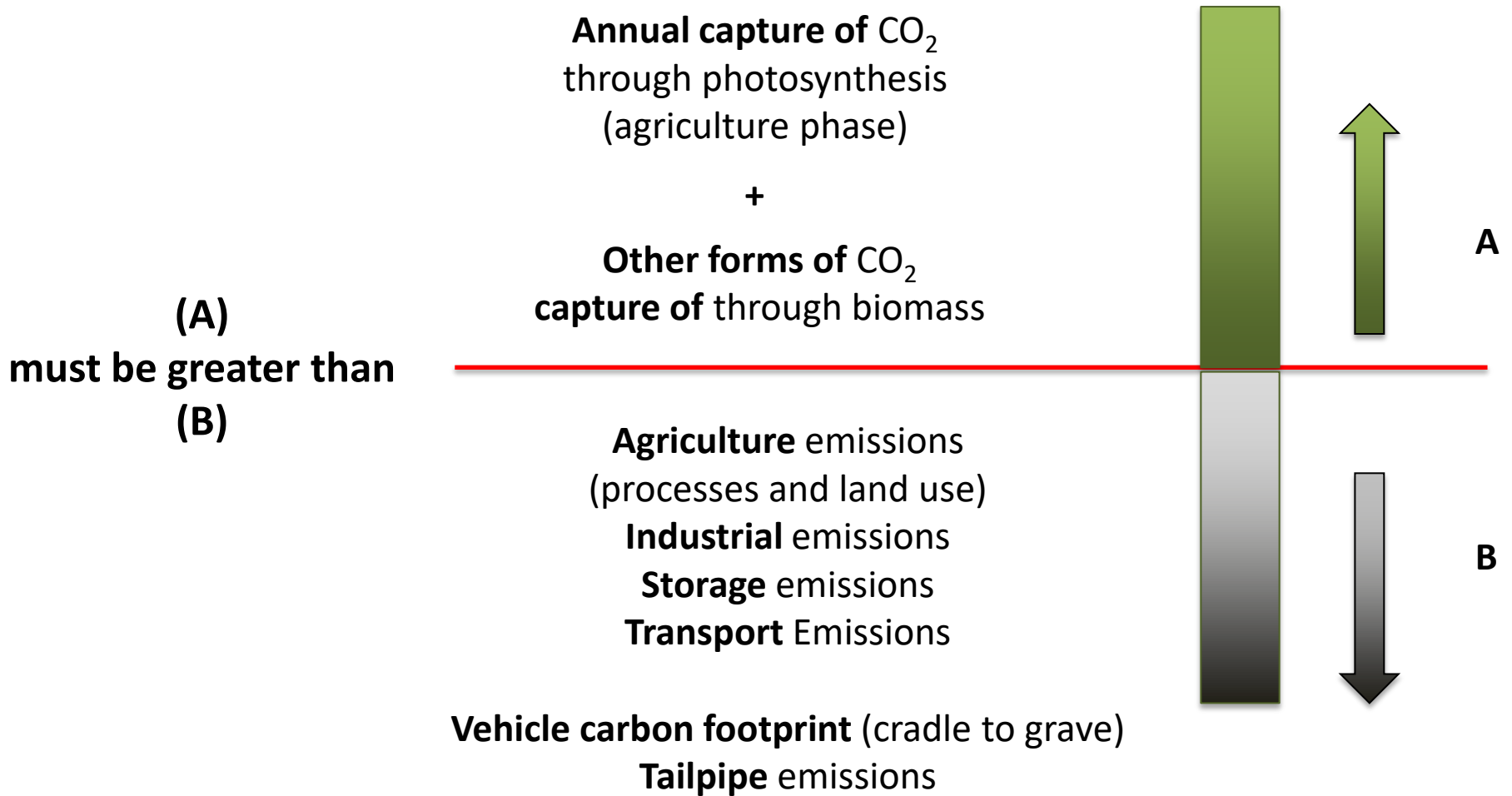
- It is the Brazilian National Biofuels Policy created in the MME that recognizes the **strategic** role of renewable fuels for the **national energy matrix** (Law 13.576/2017)
- Materializes an **effective** contribution to a cleaner energy matrix
- Sustainable environment for **investments** up to R\$ 1.3 trillion until 2030
- Creates the Brazilian “**Carbon Capture Machine**” per unit of energy increasing efficiency in the production of biofuels
- Creates an **integrative** agenda with the Brazilian automotive industry (ethanol electrification) and the petroleum industry (smooth transition)
- Creates **competition** in the fuel market benefiting the consumers, which will pay less for fuels
- **Reduces** the growing national **deficit** with fuel imports

RenovaBio: A Market Solution



- It is **not** subsidy
- It is **not** an increase in taxes
- It is a Brazilian "**CARBON CAPTURE MACHINE**"
- It values the **service of CO₂ withdrawal** from the atmosphere made by the national production of biofuels
- Generates more **competition and efficiency** for the market, which results in lower prices for consumers

Machine Modeling



RenovaCalc – LCA Calculator



RenovaBio

Helps to increase (A)
and to decrease (B)

Biodiesel

Nome da Usina: _____
CNPJ: 00.000.000/0000-00
Responsável pelo preenchimento: _____
Telefone: (00) 0000-0000

Intensidade de Carbono (g CO ₂ eq/MJ)		Nota de Eficiência Energético-Ambiental (g CO ₂ eq/MJ)	
Biodiesel	0,4	Fóssil substituído: Diesel	86,1
Óleo de soja próprio - agrícola	0,0		86,5
Óleo de soja próprio - extração	0,0	Redução de emissões	99%
Outros óleos	0,0		
Transesterificação	0,0		
transporte	0,0		
uso	0,4		

Fase agrícola - Dados consolidados

Informações gerais
Área total: _____ ha
Produção total (base úmida): _____ t soja
Umidade: _____

Corretivos
Calcário calcítico: _____ kg/t soja
Calcário dolomítico: _____ kg/t soja
Gesso: _____ kg/t soja

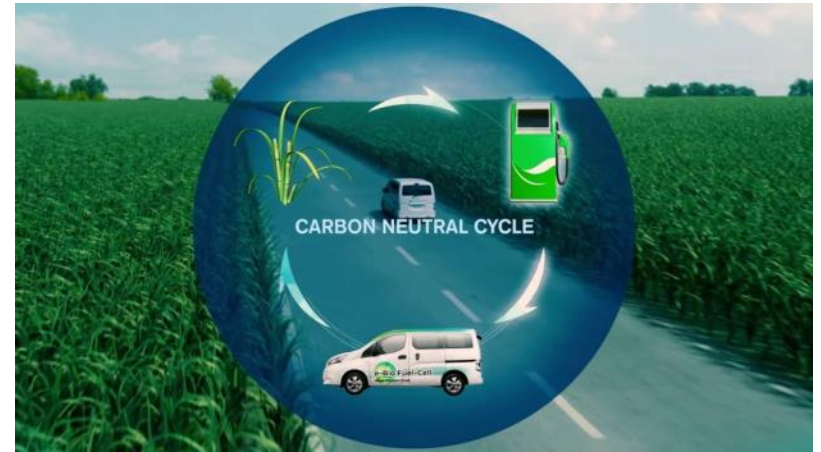
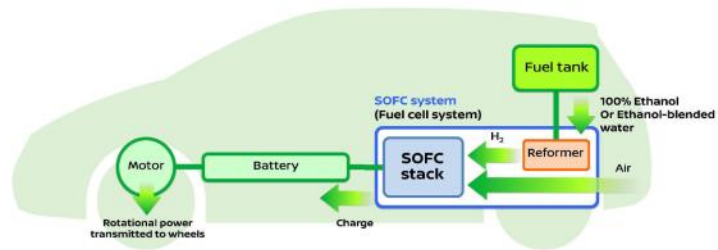
Sementes

Instruções | Diretório | E1GC | E1G2G | E2G | E1G Flex | E1GM | E1GM | Biodiesel | CombAlterHEFA | Biometano ...

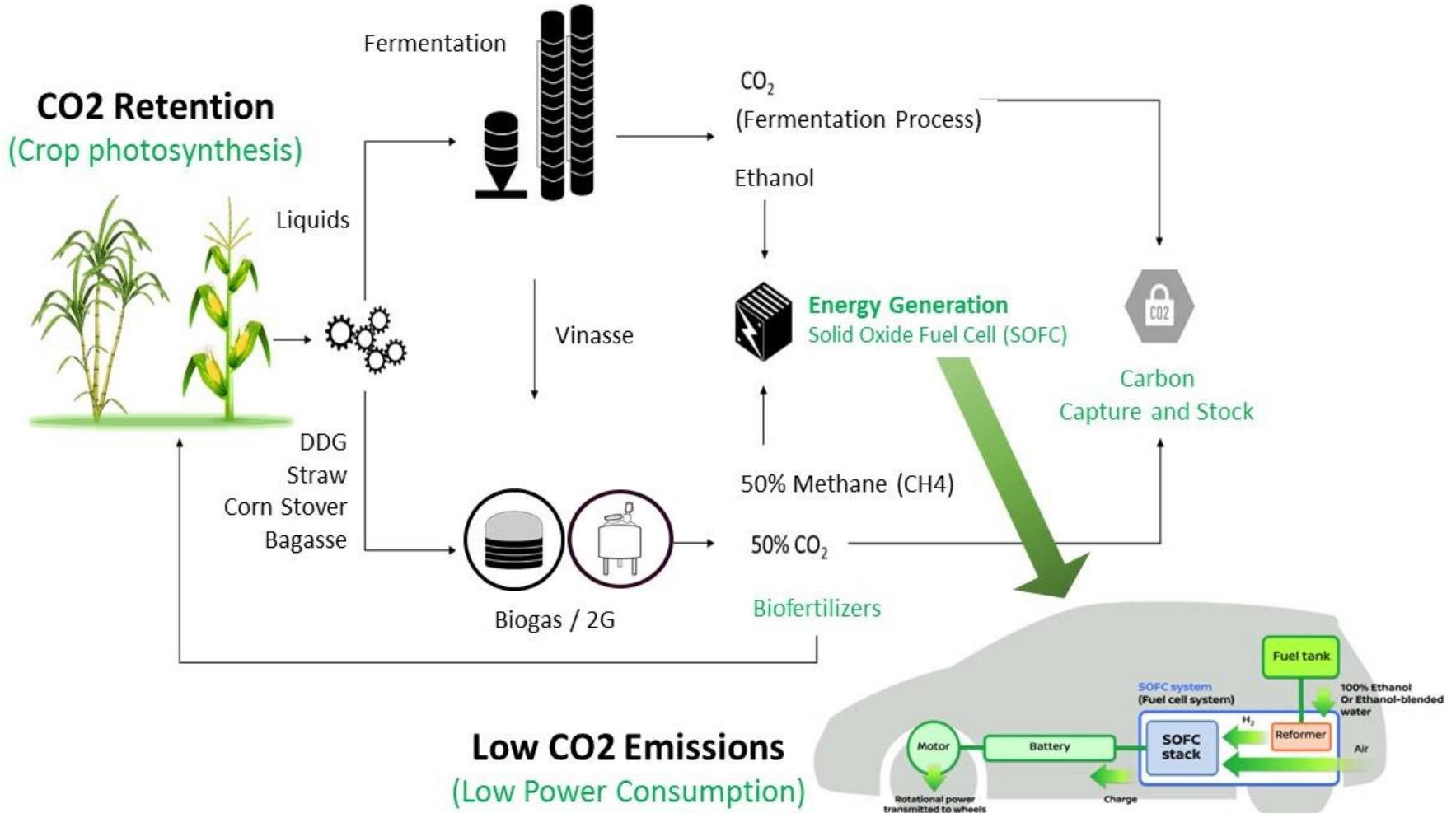


ELETRIFICATION FUEL CELL

Helps to decrease (B)



Can we do CCS using bioeconomy?



We need a new product
to save the world and
Renovabio can deliver it.