



CÂMARA DOS
DEPUTADOS



Esverdeando o Hidrogênio e Gerando Grandes Oportunidades

Gonçalo Pereira

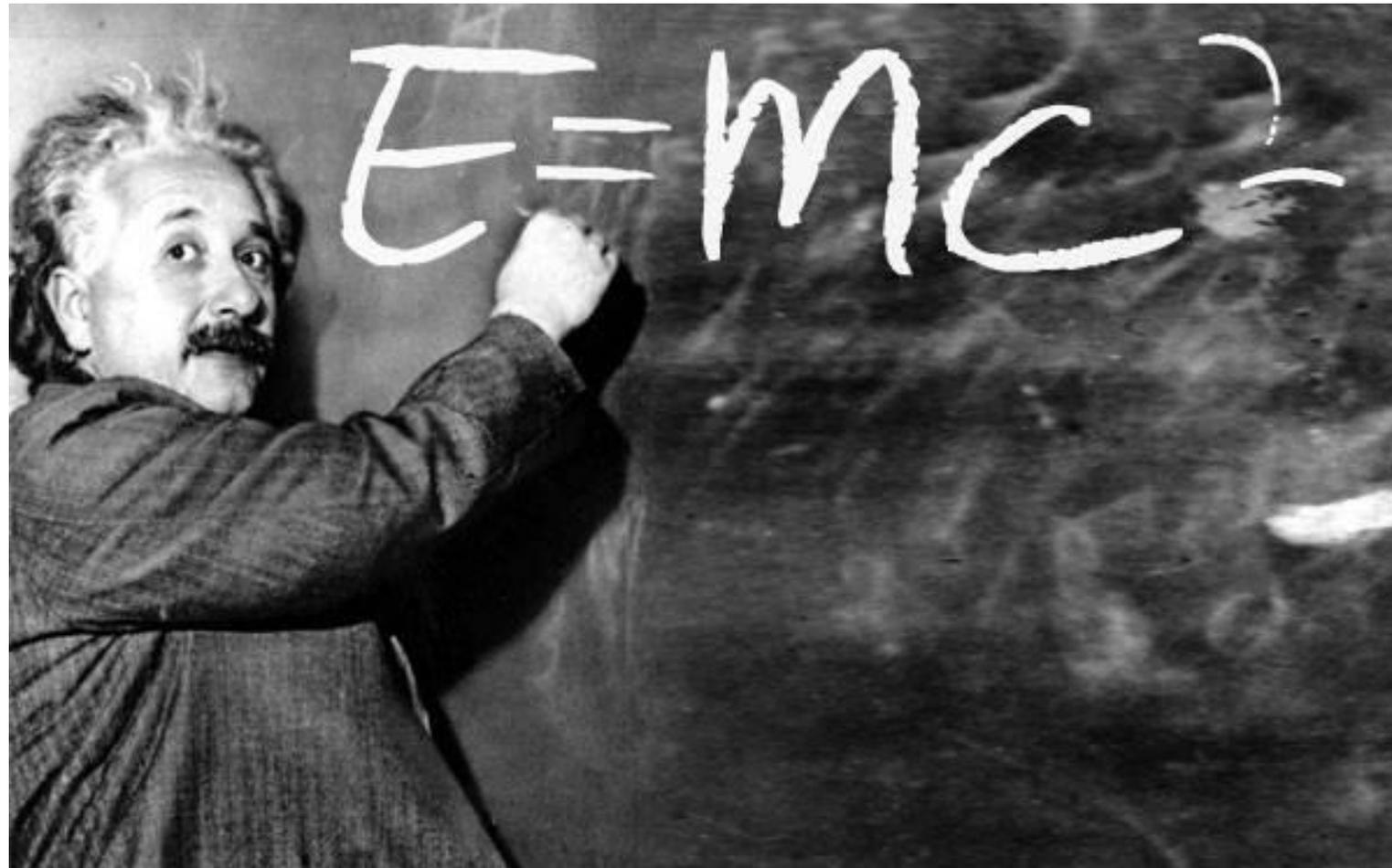
Brasília, 11/07/2023



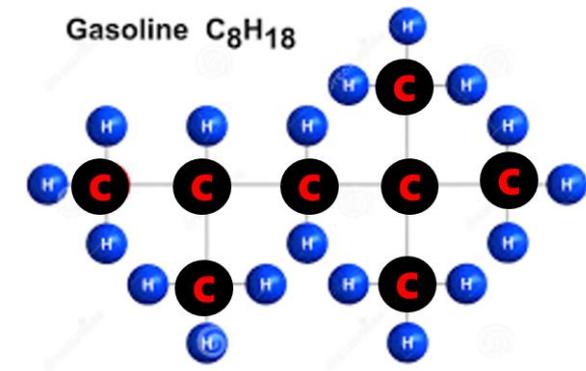
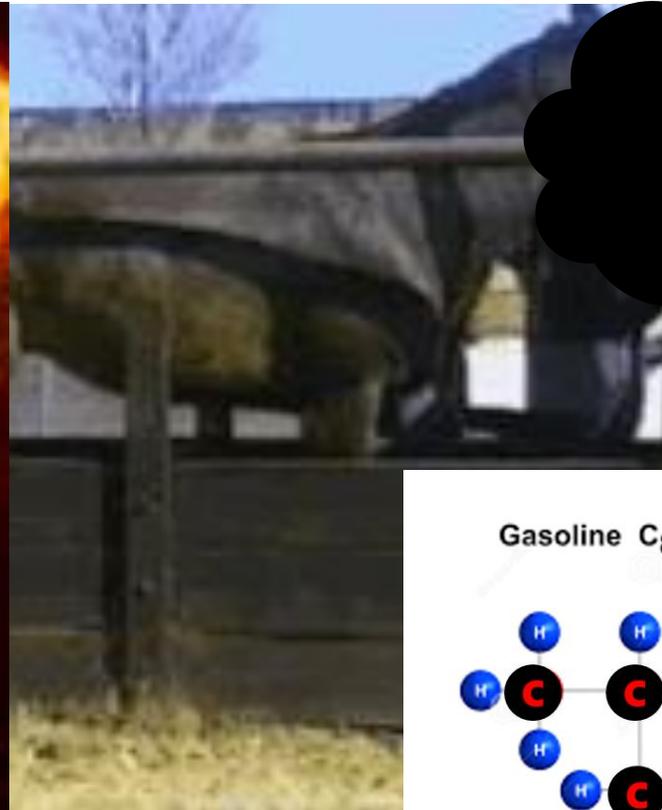
UNICAMP



Siga a Energia...

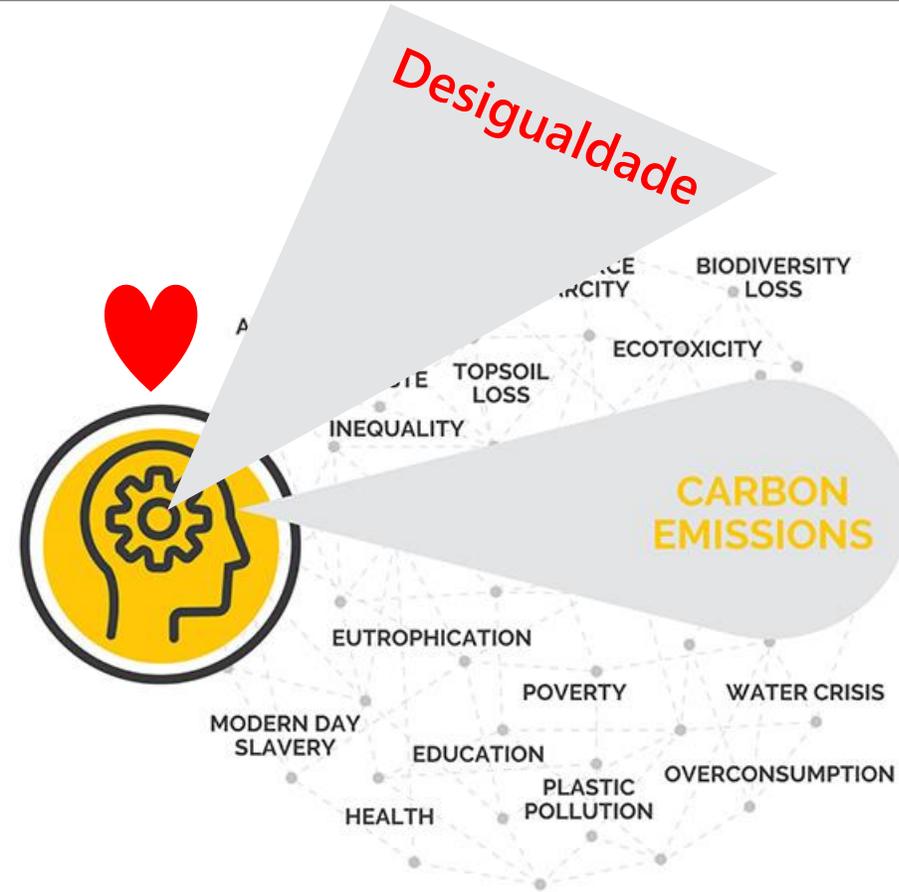


Sempre foi o Hidrogênio



1,5 MJ/kg

Túnel de Carbono



Dentro do Túnel



Saindo do Túnel



Eu amo veículos elétricos – e fui um dos primeiros a adotar. Mas cada vez mais me sinto enganado

Rowan Atkinson



Sadly, keeping your old petrol car may be better than buying an EV. There are sound environmental reasons not to jump just yet

The electric car ‘revolution’ is a disaster before it’s begun

Politicians are forcing electric cars on a public that doesn’t want them



BEN MARLOW
CHIEF CITY COMMENTATOR

1 July 2023 • 6:00am

UK NEWS WEBSITE OF THE YEAR

The Telegraph

A Máquina “Esperta” de Concentração de CO₂

BBC NEWS BRASIL

Notícias Brasil Internacional Economia Saúde Ciência Tecnologia Vídeos

A inovadora máquina que absorve CO₂ da atmosfera e o transforma em um gás com valor econômico

Matt McGrath
Correspondente de meio ambiente da BBC

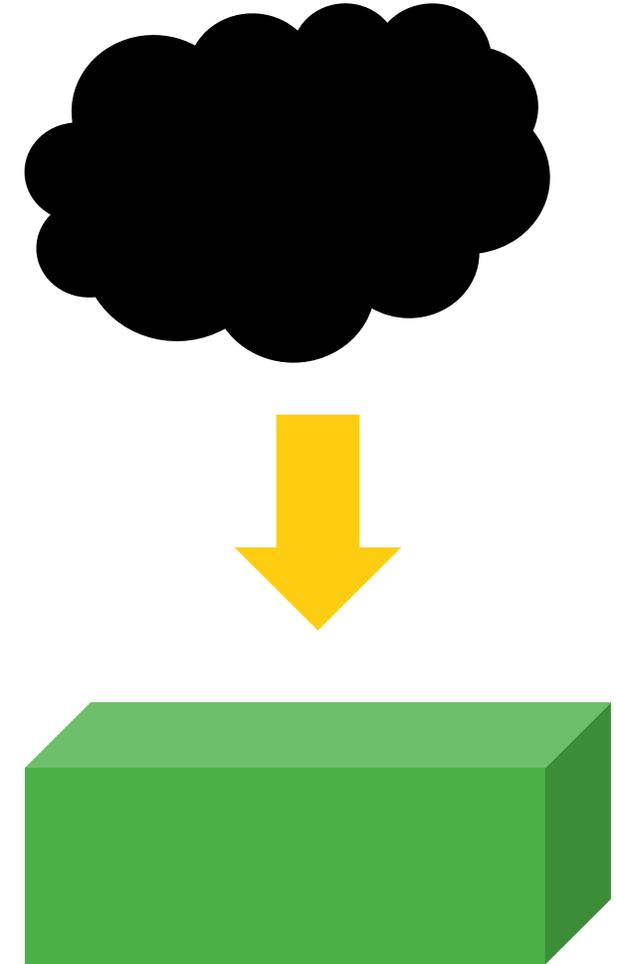
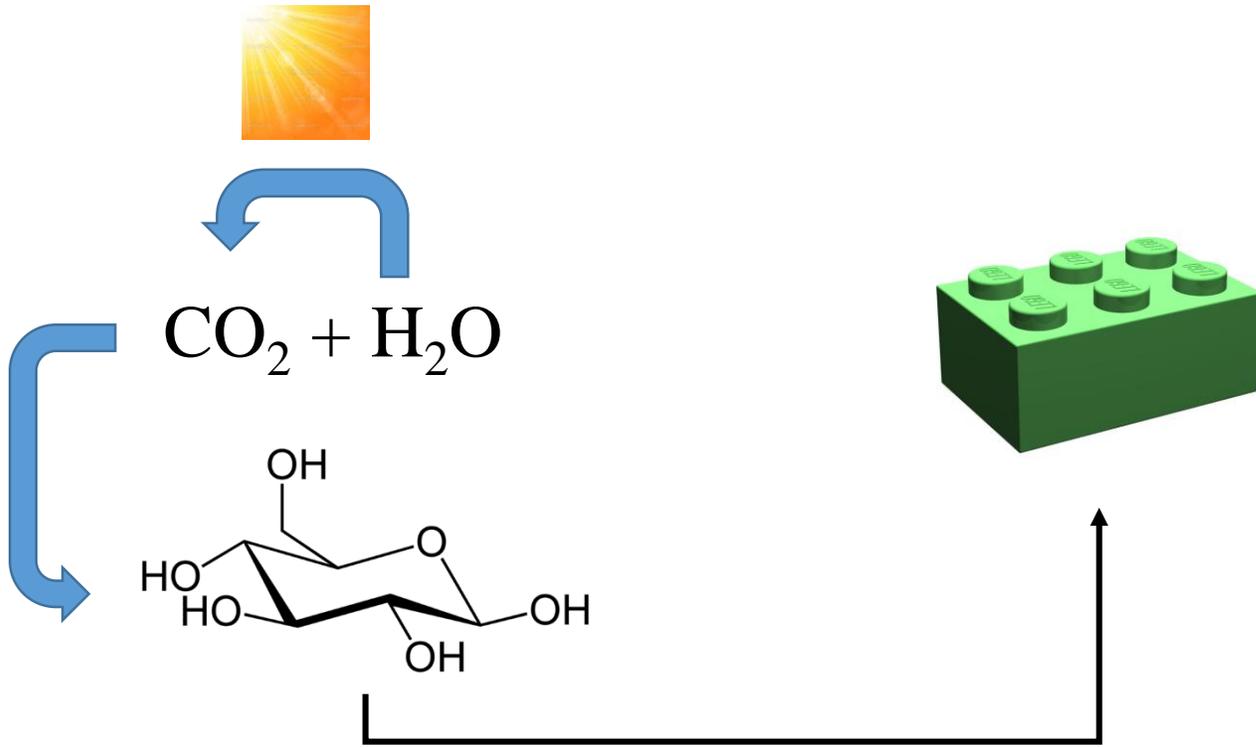
17 novembro 2017



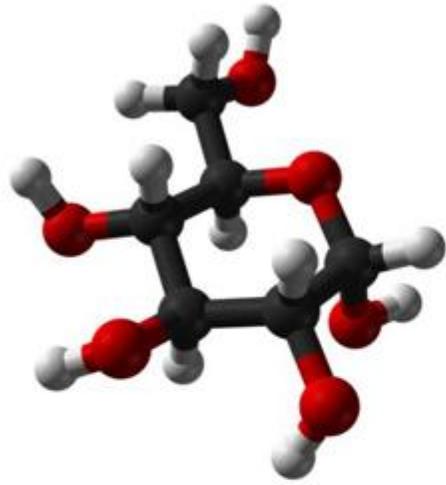
Atualmente, o CO₂ absorvido pelo dispositivo é vendido por US\$ 600 a tonelada
(Crédito: Climeworks)

U\$ 500,00/t – Custo Mínimo

Aprendendo com a Natureza



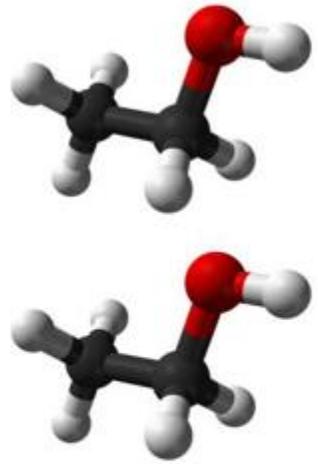
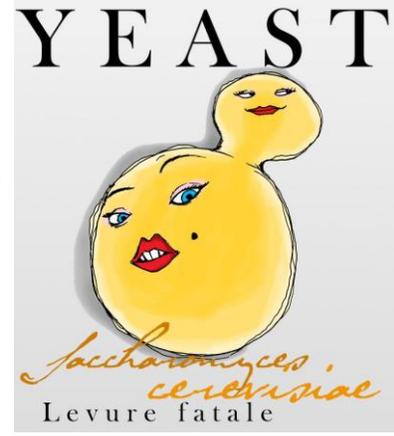
A Máquina realmente ESPERTA para concentrar CO₂



Glucose (six-carbon sugar)
 $C_6H_{12}O_6$
180

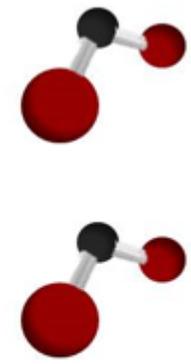
Yeast
Saccharomyces cerevisiae

→



Ethanol
 $2 C_2H_5OH$
46 (2)

+

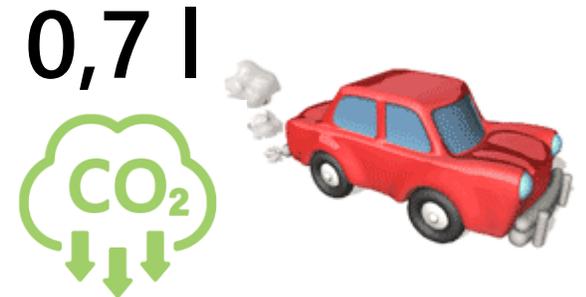
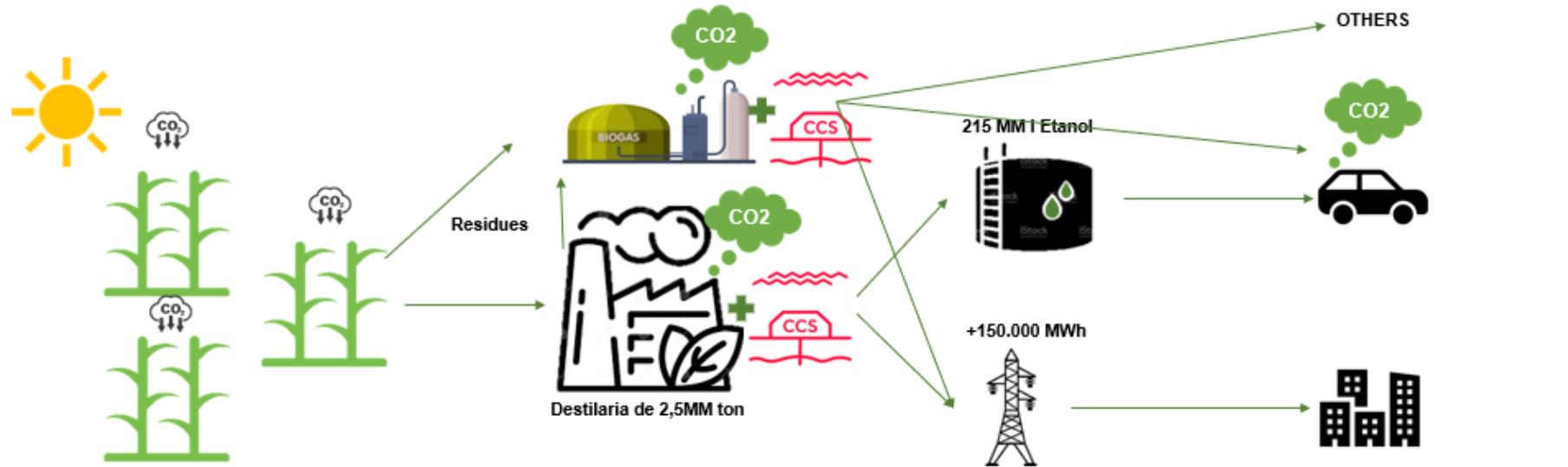


Carbon dioxide
 $2 CO_2$
44 (2)



Luz no fim do Túnel de CO₂

Caminho do CO₂ no setor sucroenergético – Potencial BECCS

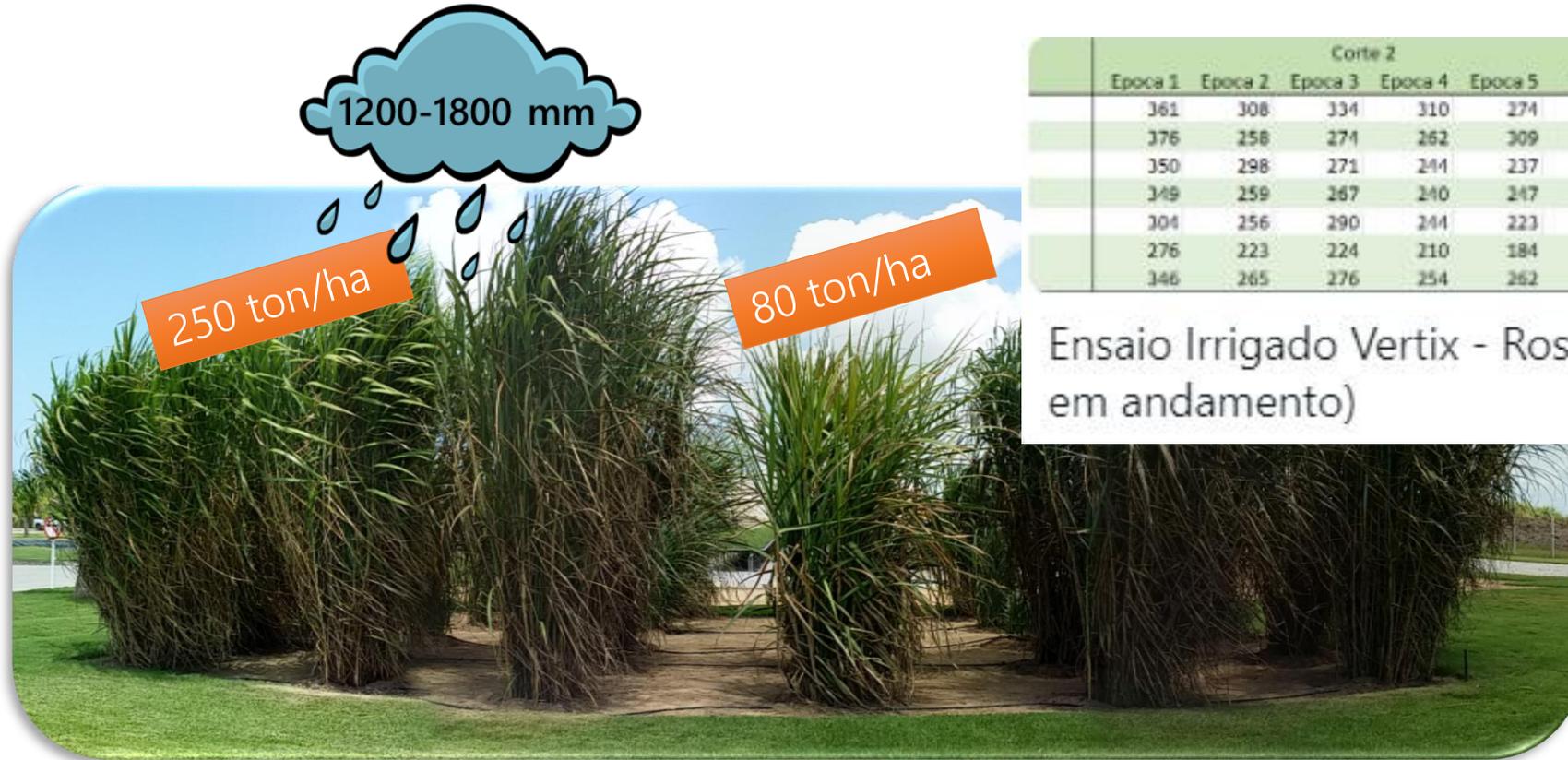


em CO ₂ eq	Cana de açúcar	Industrialização	Consumo	Balanco
Emissões Processo	Captura Fotossíntese - 952k ton	Fermentação : +31kton (Δ124kt*) Cogeração: +98k ton (Δ390kt*) Total: +129k ton	Emissões combustão etanol: +309k ton	-514k ton
Emissões "Manejo"	Emissões Manejo + 121k ton	Emissões Industria: + 6k ton	Emissões transporte e uso: +11k ton	-376 k ton

Tomaz Pereira



Freeing Up Genetics: Energy Cane



Energy-cane

Sugarcane

Energy-cane

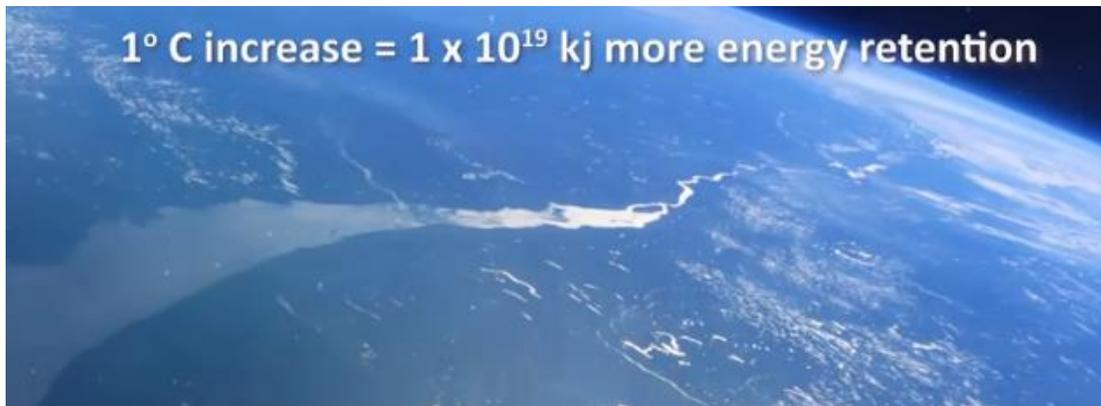
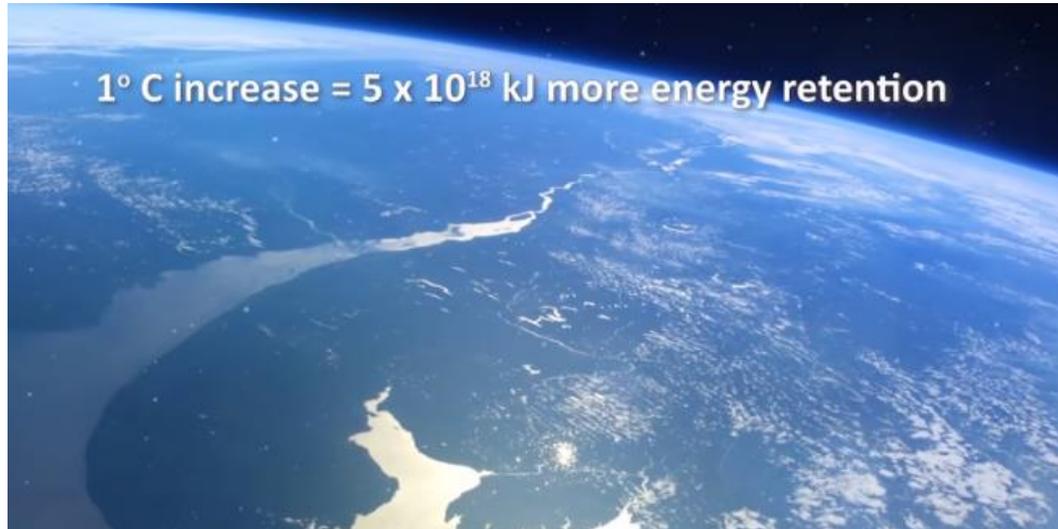
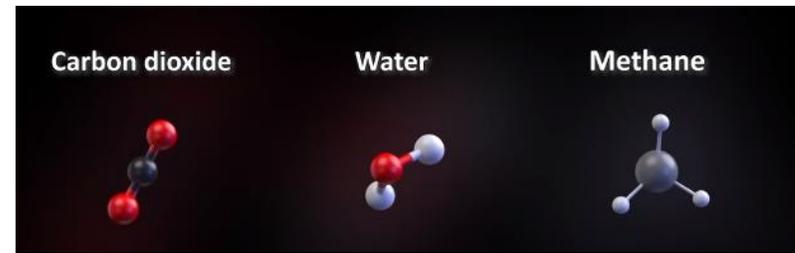
471 t/ha

Epoca 1	Corte 2					Média	Corte 3				
	Epoca 2	Epoca 3	Epoca 4	Epoca 5	Epoca 1		Epoca 2	Epoca 3	Epoca 4	Epoca 5	
361	308	334	310	274	317	471	255				
376	258	271	262	309	296	368	184				
350	298	271	241	237	280	301	205				
349	259	267	240	247	272	300	228				
304	256	290	244	223	263	209	218				
276	223	224	210	184	223	283	218				
346	265	276	254	262	281	334	209				

Ensaio Irrigado Vertix - Rosário BA (Terceiro corte em andamento)

11:54

Bateria Atmosférica



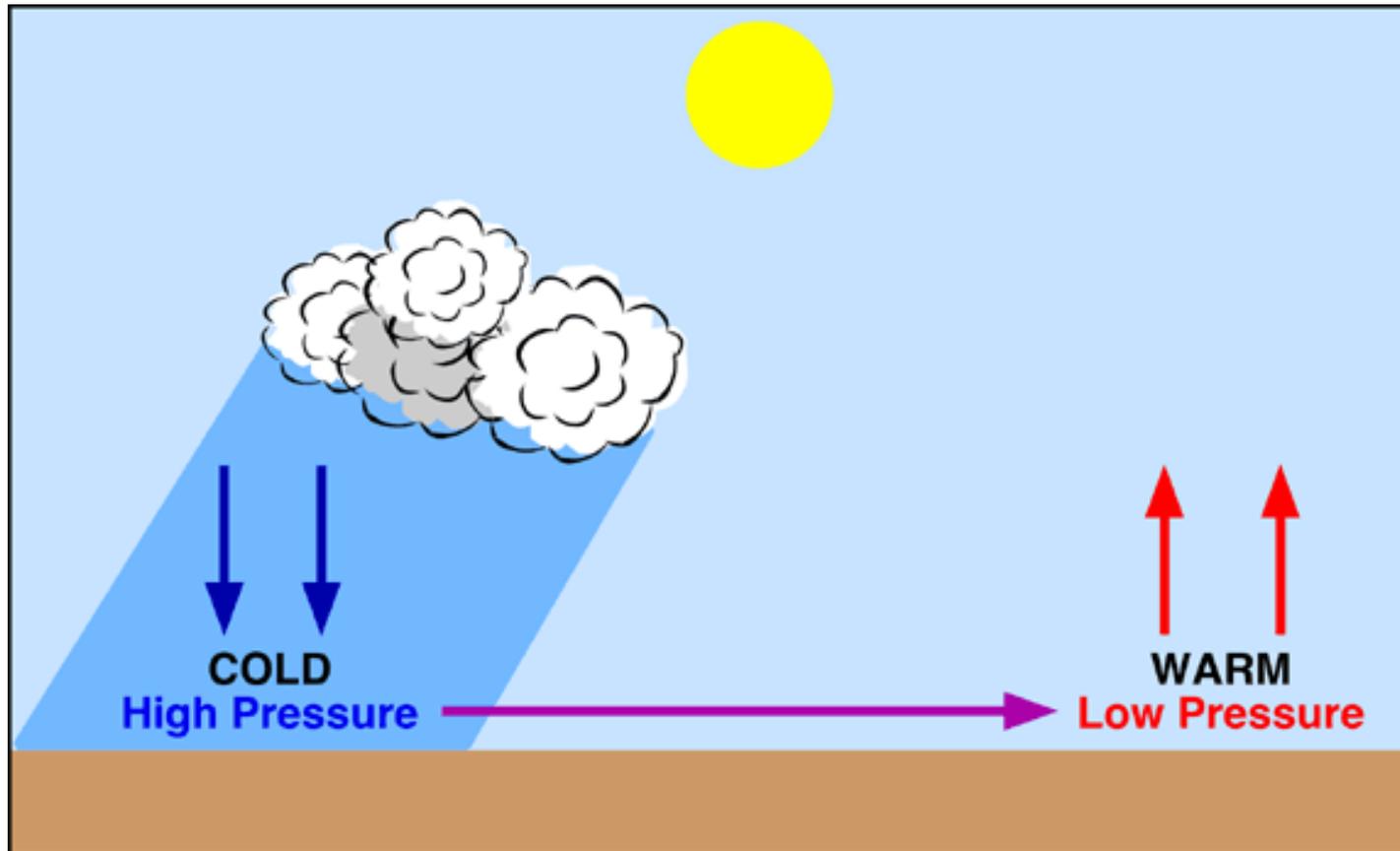
Work

Change in kinetic energy

$$W = \Delta E_{kin}$$

<https://www.youtube.com/watch?v=-skE4jCuf-w>

E é Simples Assim....



“Casa dos Ventos”





Sistema FIEB



PELO FUTURO DA INOVAÇÃO



UNICAMP

BRAVE

Brazilian Agave
Development



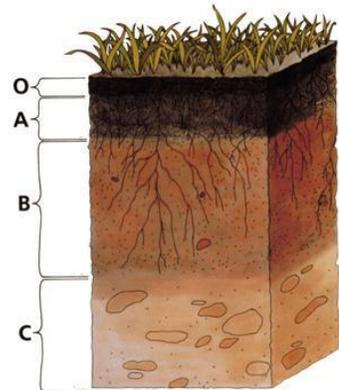
A Magnífica *Agave*



426 kg

Gç

Fisiologia Extrema



"O Problema não é a Combustão, mas o Combustível"

* Ricardo Abreu



Exclusive: EU drafts plan to allow e-fuel combustion engine cars

By Markus Wacket



BERLIN/BRUSSELS, March 21 (Reuters) - The European Commission has drafted a plan to allow sales of new cars with internal combustion engines after 2035 **if they run only on climate neutral e-fuels.**



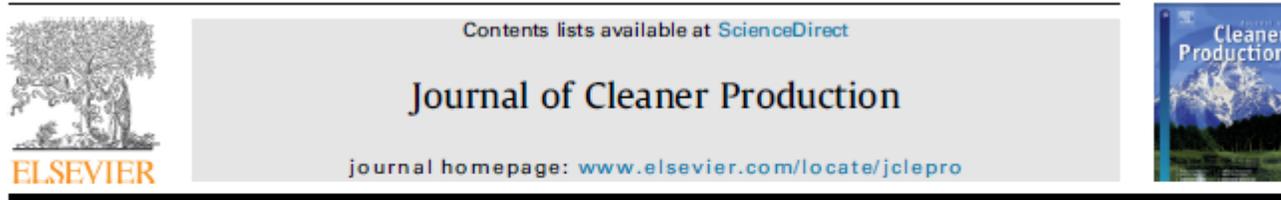
Martin Feder, do IG Metall, fala em "alerta vermelho" e adverte: **"O futuro da produção industrial está em perigo"**. Isso não é sentido apenas na Bosch, mas se aplica a muitas empresas. Atualmente, 900.000 funcionários estão envolvidos "direta e indiretamente" na produção de motores de combustão na Alemanha.

Nach Verbrenner-Aus herrscht bei Boschs Mitarbeitern „Alarmstufe Rot“

focus.de • 2 min de leitura

Potencial para Produção de Etanol e CO₂ Verde

Journal of Cleaner Production 261 (2020) 121283



Agave: A promising feedstock for biofuels in the water-energy-food-environment (WEFE) nexus



Xiaoyu Yan ^{a, b, *, 1}, Kendall R. Corbin ^{c, 1, 2}, Rachel A. Burton ^c, Daniel K.Y. Tan ^d

^a Environment and Sustainability Institute, University of Exeter, UK

^b College of Engineering, Mathematics and Physical Sciences, University of Exeter, UK

^c ARC Centre of Excellence in Plant Cell Walls, University of Adelaide, Australia

^d The University of Sydney, Sydney Institute of Agriculture, School of Life and Environmental Sciences, Faculty of Science, Sydney, NSW, 2006, Australia



Ha	Litros
1	7.414
1.000	7.414.000
1.000.000	7.414.000.000
10.000.000	74.140.000.000

3,3 MM ha – 30 Bi Litros

22 Bi Kg CO₂

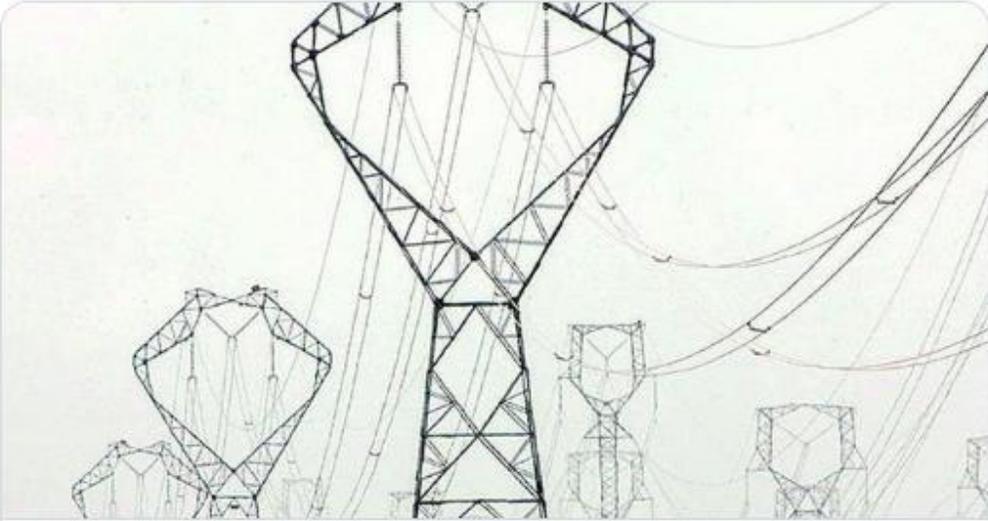
A Grande Oportunidade



Grande até demais....

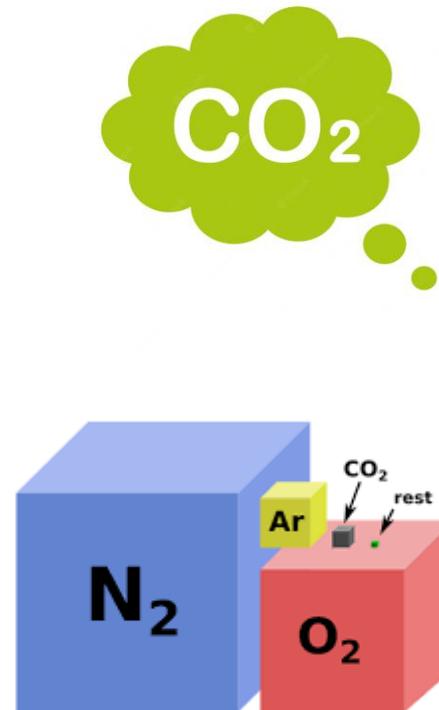
DIRECT
Estadão 
@Estadao

Brasil tem 'sobreferta gigantesca' de energia elétrica, diz diretor da Aneel (via @EstadaoEconomia)

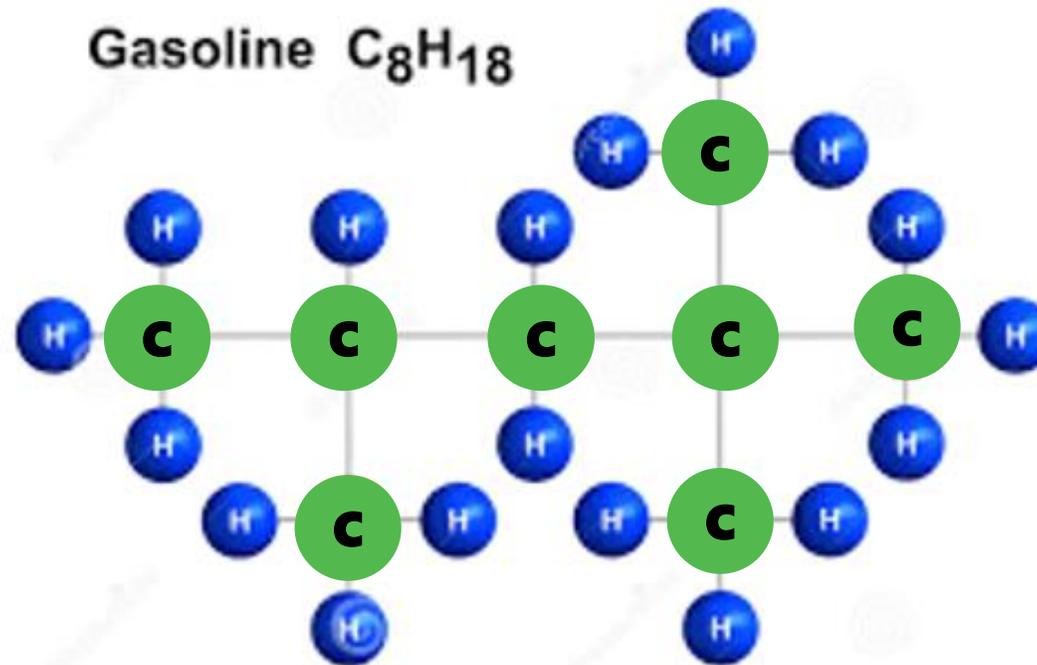


estadao.com.br
Brasil tem 'sobreferta gigantesca' de energia elétrica, diz diretor da Aneel
Sandoval Feitosa participou de audiência pública no Senado

6:50 PM · 30 de mai de 2023 · 11,3 mil Visualizações



Hidrogênio Esverdeado



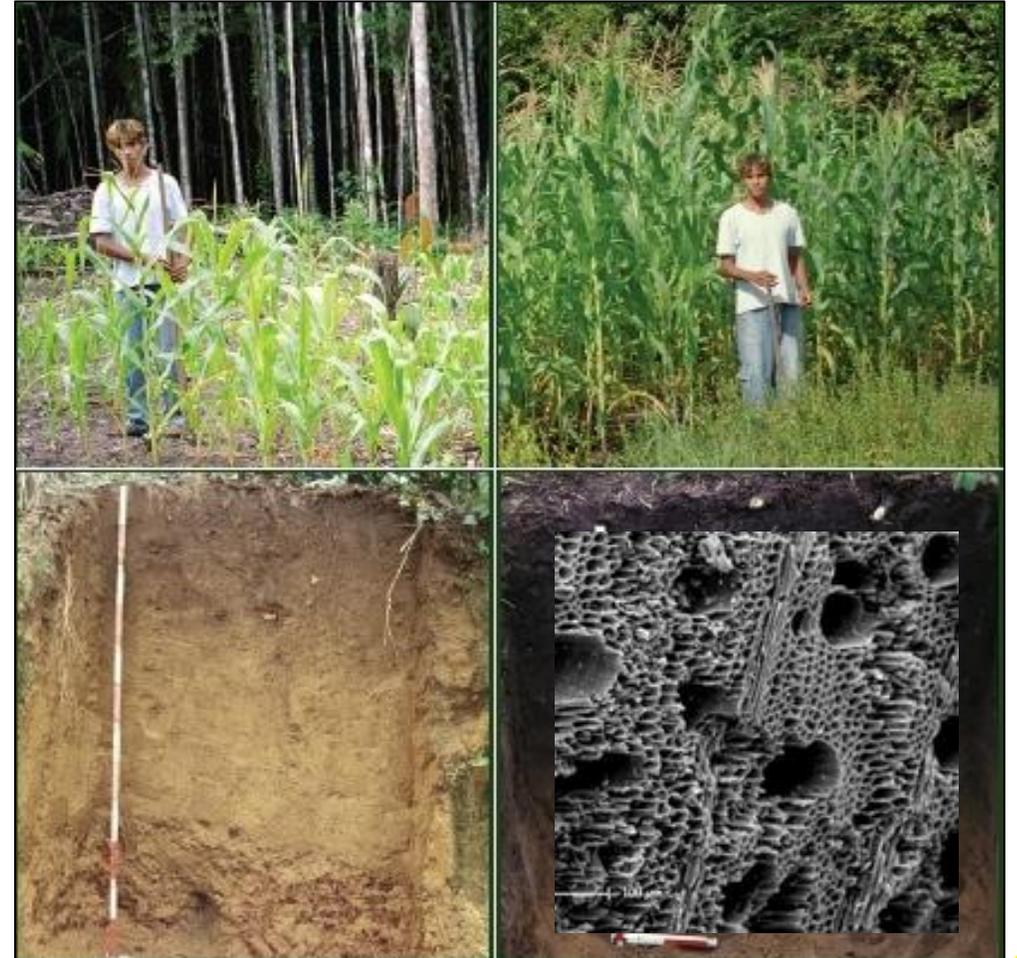
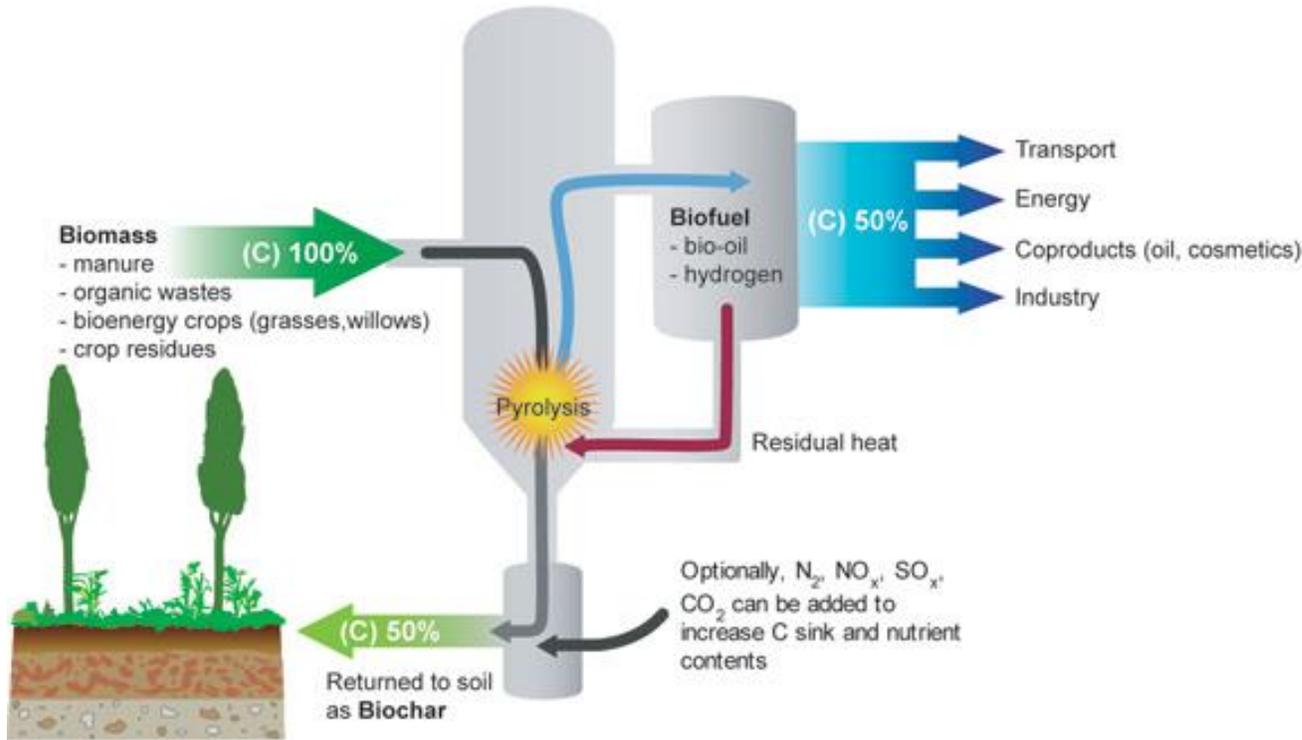
Hidrogênio Totalmente Verde



3G&S: ECR technology for Green Hydrogen

Sequestro Produtivo de Carbono

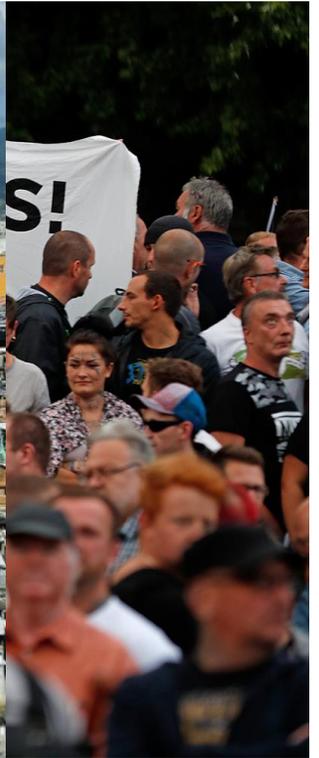
Bio-char Bio-energy Lifecycle



Um Solo para se Carbonizar...



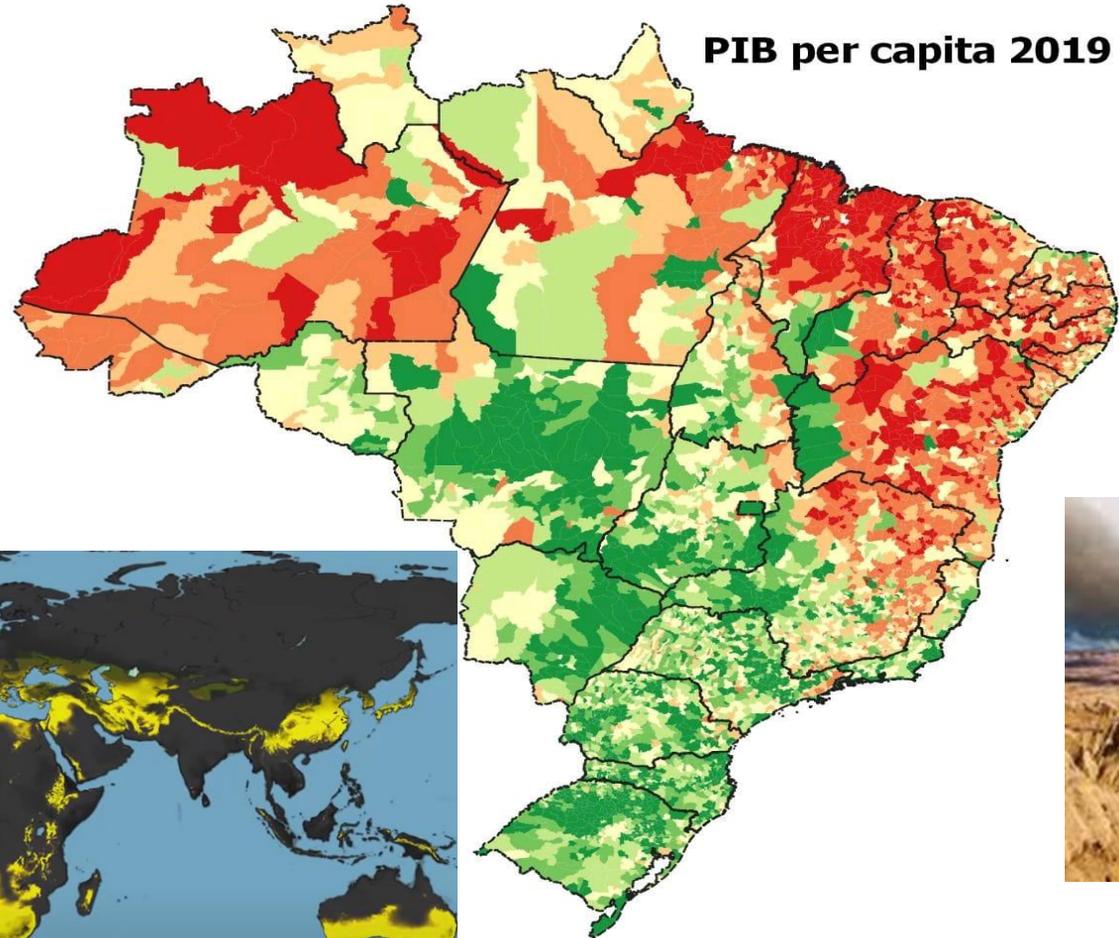
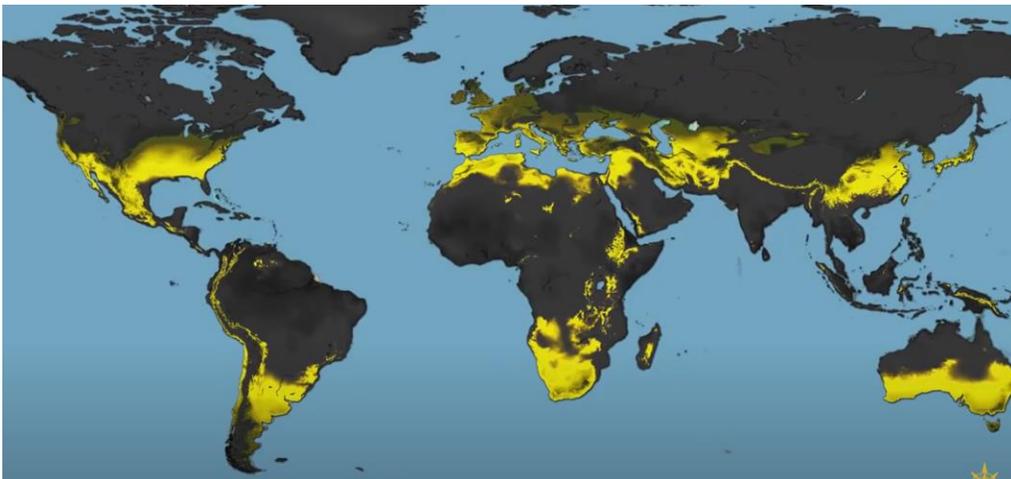
Estresse Climático e Migração



bioFuel for Food



21 – 23 °C



Equação da Bioeconomia

Forbes

FORBES > FORBES MAGAZINE > FORBES ASIA

Biggest Invention: The Transistor, The Internet....Or The Air-Conditioner? (Hint) None Of The Above

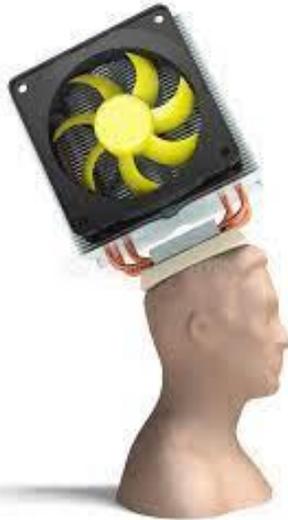
Eamonn Fingleton Contributor @

A sharp eye on media bias, official propaganda, and globaloney.

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Jul 5, 2015, 11:21am EDT

When Lee Kuan Yew, the late Singaporean patriarch, was asked to name the twentieth century's most consequential invention, he gave a characteristically counterintuitive answer. Not for him anything so obvious as television, antibiotics, the transistor, or the internet.



O bom Futuro

