



GrupoRB

www.grupoquinasabrasil.com.br

(BANDA SONORA DE STAR WARS)

PINE CHEMICALS SUSTENTÁVEIS

EPISODE III THE FUTURE BEGINS

MARIANA JORGE FERREIRA

2023, Encontro Brasileiro de Pine Chemicals





PINE CHEMICALS SUSTENTÁVEIS

EPISODE III

THE FUTURE BEGINS

MARIANA JORGE FERREIRA

2023, Encontro Brasileiro de Pine Chemicals



FALAR SOBRE ASPECTOS MAIS FILOSÓFICOS DO ASSUNTO (SUSTENTABILIDADE)

OI ?

SUSTENTABILIDADE AMBIENTAL

QUÍMICA VERDE

BIOECONOMIA

SUSTENTABILIDADE FRACA

QUÍMICA SUSTENTÁVEL

SUSTENTABILIDADE FORTE

ECONOMIA CIRCULAR

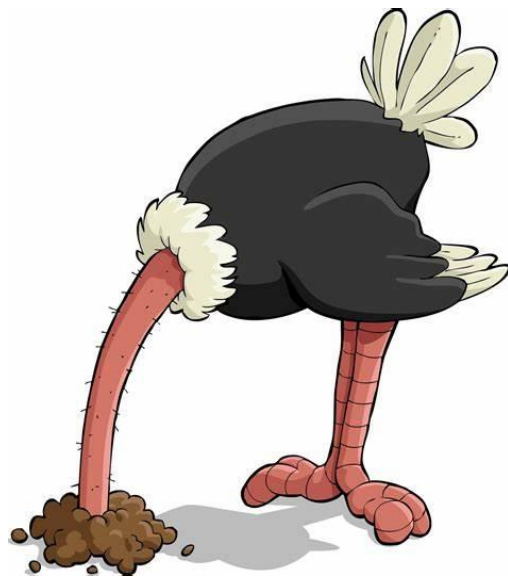
SUSTENTABILIDADE ECONÓMICA

DESENVOLVIMENTO SUSTENTÁVEL

ECONOMIA VERDE

SUSTENTABILIDADE SOCIAL





FONTE: INTERNET



PORQUE É IMPORTANTE CLARIFICAR CONCEITOS?

**O QUE É QUE ISSO INTERESSA AO SECTOR RESINEIRO E AOS
“PINE CHEMICALS”?**

VAMOS FALAR DE “PINE CHEMICALS” SUSTENTÁVEIS!

D'Amato, Dalia et al. "Green, circular, bio economy: A comparative analysis of sustainability avenues." *Journal of Cleaner Production* 168 (2017): 716-734.

Mossa, Giorgio et al. "Bioeconomy and Circular Economy Approaches Need to Enhance the Focus on Biodiversity to Achieve Sustainability." *Sustainability* (2022): n. pag.

Pelenc, Jérôme "Weak versus Strong Sustainability" (2015)

Franceschini, Simone and , Pansera, Mario "Beyond unsustainable eco-innovation: The role of narratives in the evolution of the lighting sector" *Technol. Forecast. Soc.* (2015) Chang. 92, 69–83.

Krasnodebski, Marcin "An unlikely bifurcation: history of sustainable (but not Green) chemistry" *Foundations of Chemistry* (2023)

[About green economy | UNEP - UN Environment Programme](#)

[What is circular economy and why does it matter? | Climate Promise \(undp.org\)](#)

[Basics of Green Chemistry | US EPA](#)

[ISC3 – International Sustainable Chemistry Collaborative Centre](#)

[Bioeconomy Strategy | Knowledge for policy \(europa.eu\)](#)

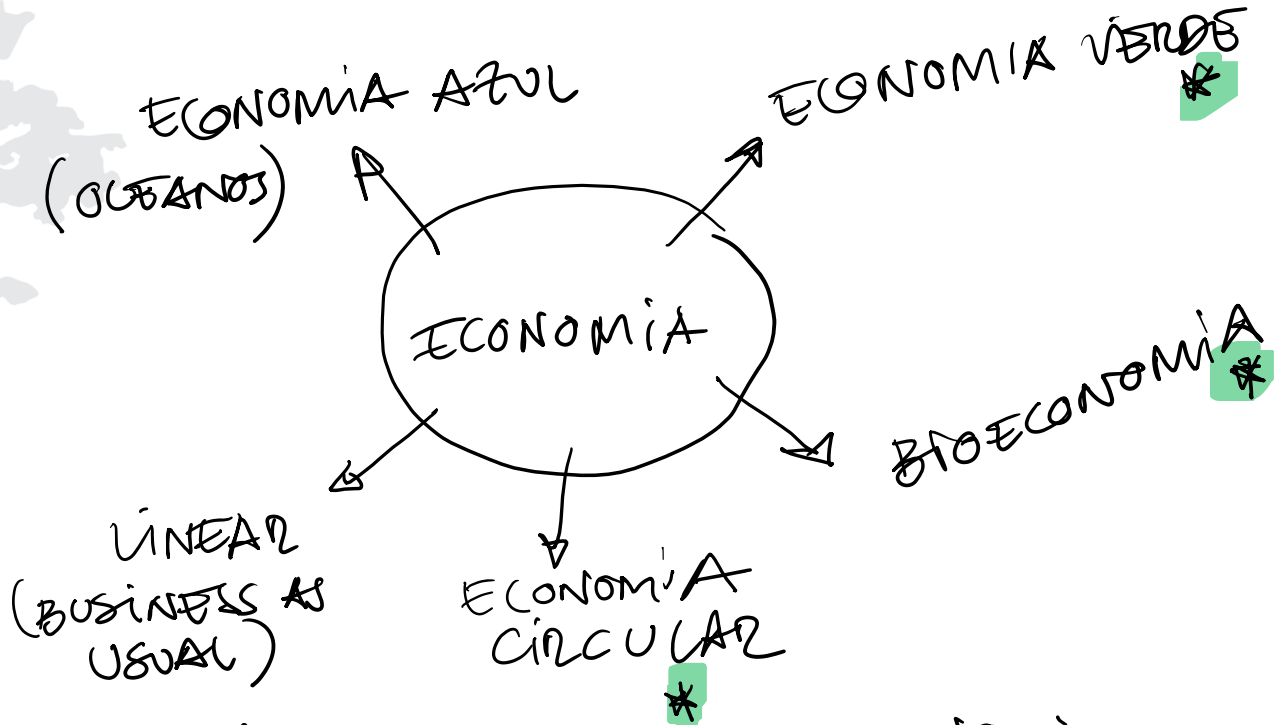
[Secretaria Nacional de Bioeconomia — Ministério do Meio Ambiente e Mudança do Clima \(www.gov.br\)](#)



SUSTENTABILIDADE
(CARACTERÍSTICA)

ECONOMIA
(CIENCIA)

QUÍMICA
(CIENCIA)



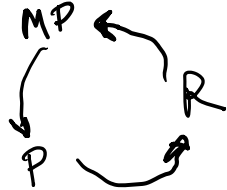
* TODOS PROPÕEM TRANSFORMAR A ECONOMIA ACTUAL
NUMA ECONOMIA MAIS SUSTENTÁVEL



ECONOMIA
VERDE

visão holística
que integra
sustentabilidade
social e
ambiental

ECONOMIA
CIRCULAR
↓
FOCO NO
PROCESSO



BIOECONOMIA

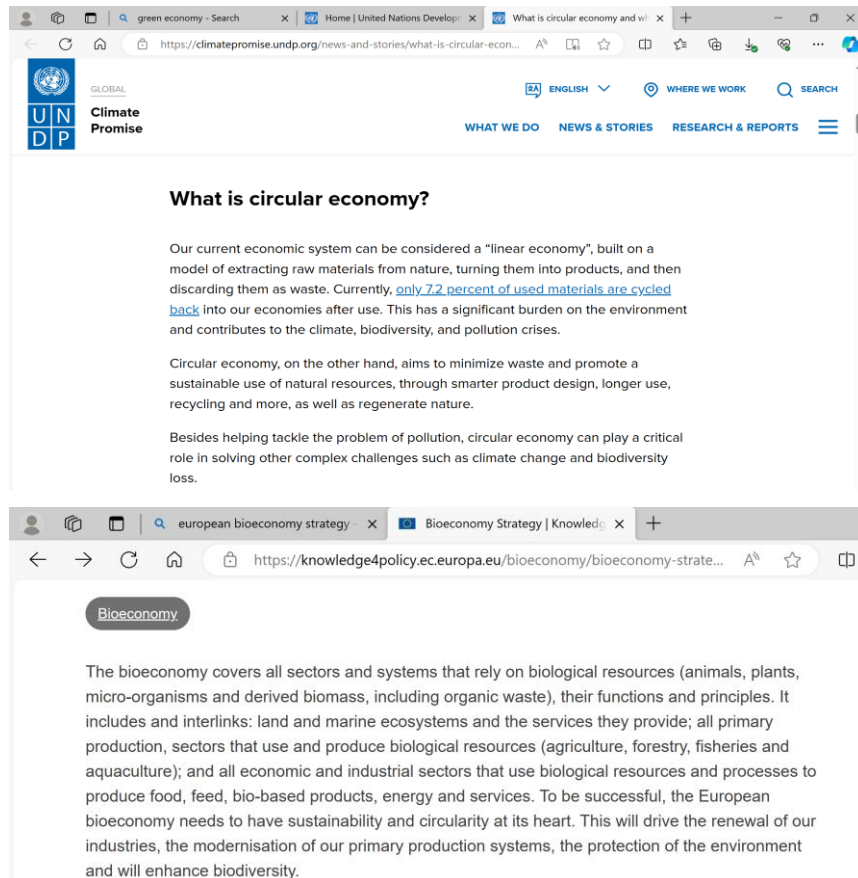
↓
FOCO NA MATÉRIA PRIMA
MP ORIGEM
NATURAL E
RENOVÁVEL



GrupoRB

An inclusive green economy is one that improves human well-being and builds social equity while reducing environmental risks and scarcities.

An inclusive green economy is an alternative to today's dominant economic model, which exacerbates inequalities, encourages waste, triggers resource scarcities, and generates widespread threats to the environment and human health. Over the past decade, the concept of the green economy has emerged as a strategic priority for many governments.



The screenshot displays three web browser tabs. The first tab, titled 'About green economy | UNEP', shows the URL <https://www.unep.org/explore-topics/green-economy> and a navigation bar with 'Overview' and 'What v'. The second tab, titled 'Home | United Nations Development Programme', shows the URL <https://climatepromise.undp.org/news-and-stories/what-is-circular-econ...> and a header with the UNDP logo and 'Climate Promise'. The third tab, titled 'Bioeconomy Strategy | Knowledge4Policy', shows the URL <https://knowledge4policy.ec.europa.eu/bioeconomy/bioeconomy-strate...> and a header with 'Bioeconomy'.

What is circular economy?

Our current economic system can be considered a "linear economy", built on a model of extracting raw materials from nature, turning them into products, and then discarding them as waste. Currently, [only 7.2 percent of used materials are cycled back](#) into our economies after use. This has a significant burden on the environment and contributes to the climate, biodiversity, and pollution crises.

Circular economy, on the other hand, aims to minimize waste and promote a sustainable use of natural resources, through smarter product design, longer use, recycling and more, as well as regenerate nature.

Besides helping tackle the problem of pollution, circular economy can play a critical role in solving other complex challenges such as climate change and biodiversity loss.

Bioeconomy

The bioeconomy covers all sectors and systems that rely on biological resources (animals, plants, micro-organisms and derived biomass, including organic waste), their functions and principles. It includes and interlinks: land and marine ecosystems and the services they provide; all primary production, sectors that use and produce biological resources (agriculture, forestry, fisheries and aquaculture); and all economic and industrial sectors that use biological resources and processes to produce food, feed, bio-based products, energy and services. To be successful, the European bioeconomy needs to have sustainability and circularity at its heart. This will drive the renewal of our industries, the modernisation of our primary production systems, the protection of the environment and will enhance biodiversity.

Table 4
Six main topics emerging in CE, GE and BE concepts.

Topic	CE	GE	BE
1	Sustainable development in industrialization and urbanization	Sustainable development	Biomass and renewables in energy production
2	Recycling in products life cycle for waste reduction	Green investments, especially in urban context	Rural policies esp. in Europe
3	Industrial symbiosis, especially in EU	Tourism, business, education, employment	Biotechnology applications in health science
4	Efficiency evaluation techniques in logistic/supply chain management systems	Biomass and renewables in energy production	Biotechnology applications in materials science
5	Carbon emission and energy in production plants	Recycling, re-use, reduction in products life cycle	Biomass supply/demand, especially wood
6	Greening the supply chain	Conservation and land use	Biosecurity

Table 5
Main aspects included in CE, GE and BE concepts in regard to the social and environmental dimensions of sustainability.

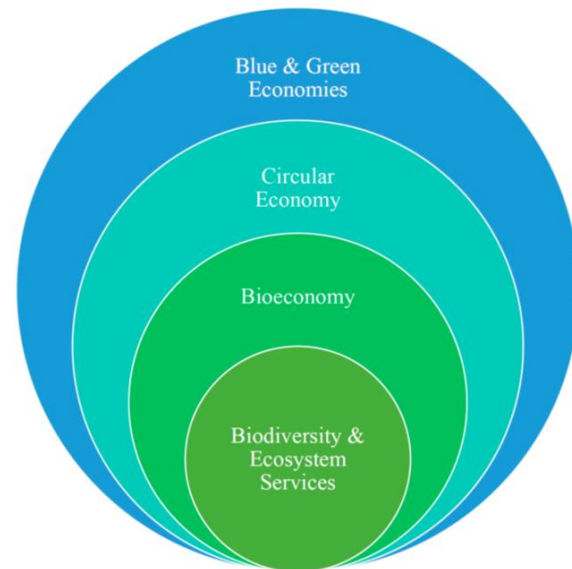
	Concepts Sustainability dimensions	
	Environmental	Social
CE	Recycling/re-use, efficiency, industrial symbiosis, greener supply chain.	Economy, development, utilization.
GE	Conservation, water, land, biodiversity, food, security.	Sustainable development; Green investments, tourism, business, employment, education.
BE	Biosecurity, crops, species, risk, yield, invasive.	Rural policies; Research and applications in health science.

Table 2. Summary of the main challenges and opportunities in implementing bioeconomy and circular economy approaches.

Challenges	Opportunities
Definitions are confused and unharmonized.	Work, thinking and experience exist that can be built on
Biodiversity is neglected in both models and proof of concept is lacking on how biodiversity will benefit.	Sustainability is a topical, relevant and timely issue
Many elements of society are excluded.	Diverse and influential stakeholders are involved and engaged
Monitoring is weak with no use of biodiversity indicators	Some indicators have been identified
Inflated expectations of what each approach can achieve. Implementation is unharmonized and causes competition. Legal and organizational complexity across multiple sectors	The COVID-19 pandemic may create the stimulus for improving economic models
Limited organizational and operational capacity for implementation.	

Mossa, Giorgio et al. "Bioeconomy and Circular Economy Approaches Need to Enhance the Focus on Biodiversity to Achieve Sustainability." *Sustainability* (2022): n. pag.

Figure 1. Bioeconomy can be seen as a subset of the broader circular economy and the blue and green economies.



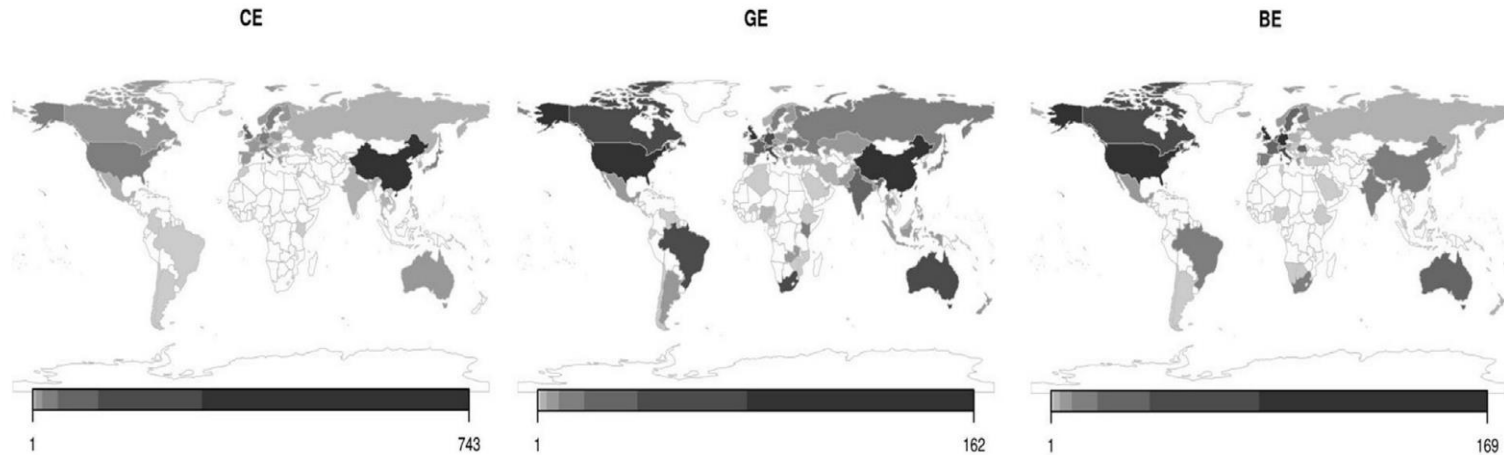
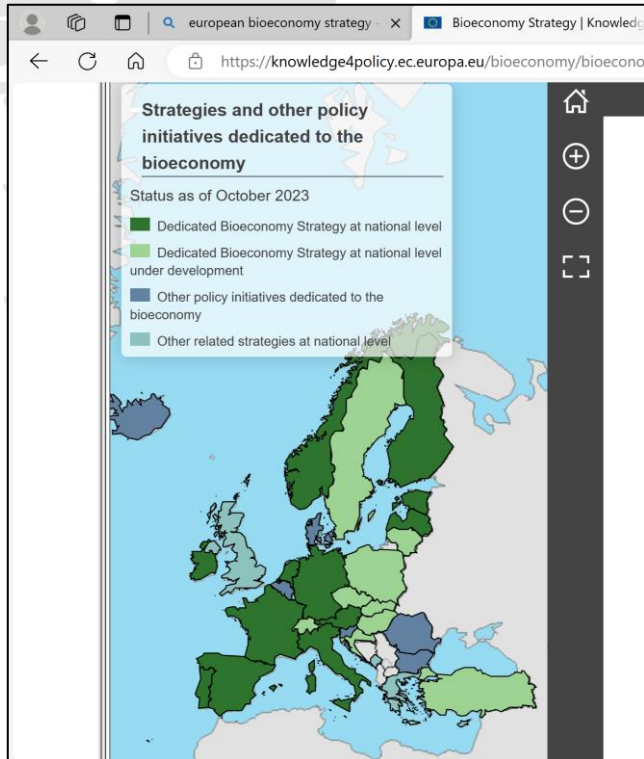


Fig. 2. Geographical provenience of the literature. The colour scale refers to the number of articles.

D'Amato, Dalia et al. "Green, circular, bio economy: A comparative analysis of sustainability avenues." *Journal of Cleaner Production* 168 (2017): 716-734.



Daniel-Paul Dima e mais 1 pessoas 1 comentário

Gostei Comentar Compartilhar Enviar

Reações

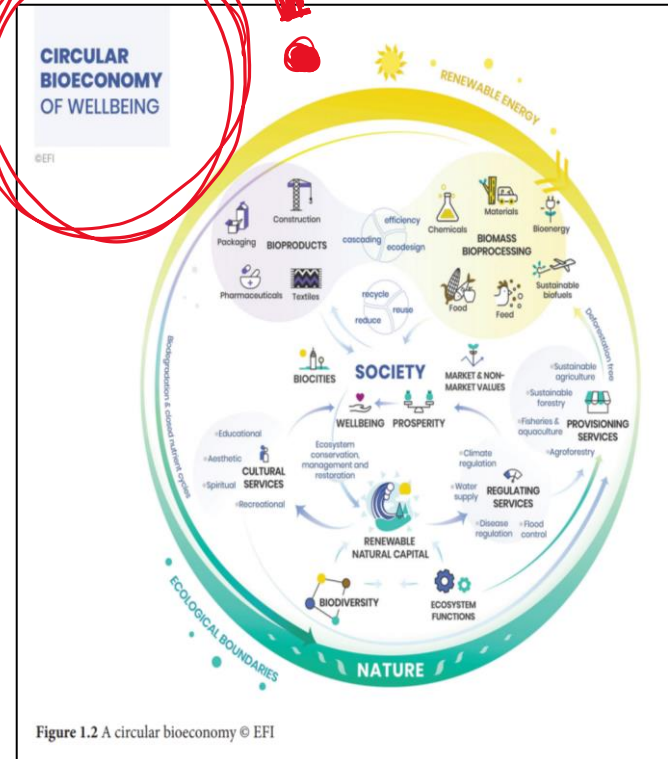
Comentários Mais relevantes

Daniel-Paul Dima · 1º
Sustainable Wood-Based Bioeconomy - Cost-E...
2 h

This is what is going on in Europe ...some shall gain from bioeconomy, while others shall lose from biodiversity!
Let's balance things!

[Ver tradução](#)

Gostei · 1 | Resposta



SUSTENTABILIDADE

“Sustainability is the ability to exist constantly.” (Wikipedia, 2019)

“The quality of being able to continue over a period of time.” (Cambridge Dictionary, 2019)

“The concept of sustainability was originally coined in forestry, where it means never harvesting more than what the forest yields in new growth.” (Tom Kuhlman and John Farrington, *What is Sustainability?*, 2010)

DESENVOLVIMENTO SUSTENTÁVEL

“Humanity has the ability to make development sustainable to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs.” (Brundtland Report, UN, 1987)

3 PILARES DO DESENVOLVIMENTO SUSTENTÁVEL

“For sustainable development to be achieved, it is crucial to harmonize three core elements: economic growth, social inclusion and environmental protection. These elements are interconnected and all are crucial for the well-being of individuals and societies.” (FAQ, Sustainable Development Summit , UN, 2015)

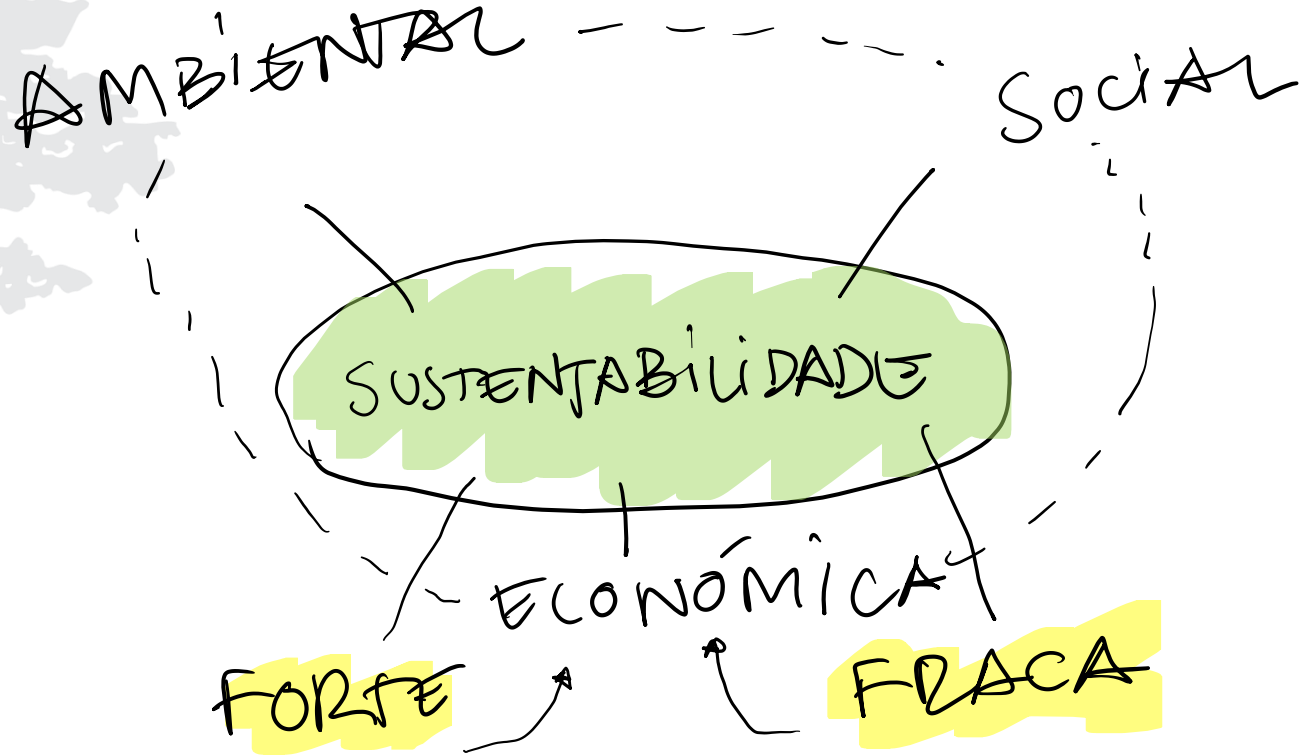


UN ODGs



Wikipedia, Sustainable Development





DESENVOLVIMENTO SUSTENTÁVEL

The fundamental debate regarding sustainable development is whether we choose to adopt a strong or a weak conception of sustainability. Weak sustainability postulates the full substitutability of natural capital whereas the strong conception demonstrates that this substitutability should be severely seriously limited due to the existence of critical elements that natural capital provides for human existence and well-being.

Pelenc, Jérôme "Weak versus Strong Sustainability" (2015)

SUSTENTABILIDADE FRACA

CAPITAL NATURAL

+

CAPITAL PRODUZIDO /
MANUFATURADO

SUSTENTABILIDADE FORTE

CAPITAL NATURAL COM
ELEMENTO CRÍTICO E
INSUBSTITUÍVEL



GrupoRB

QUÍMICA

- CIÊNCIA

QUÍMICA ORGÂNICA

- DISCIPLINA
DENTRO DA
QUÍMICA

QUÍMICA VERDE / QUÍMICA SUSTENTÁVEL

MOVIMENTOS / CORRENTES DA QUÍMICA (CIÊNCIA)
TRANSVERSAIS AS DIVERSAS DISCIPLINAS



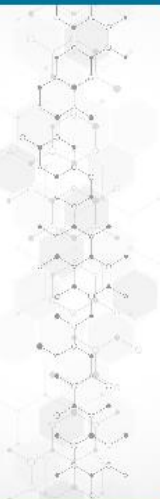
GrupoRB



The 12 Principles of Green Chemistry

- Prevent Waste
- Design Safer Chemicals and Products
- Design Less Hazardous Chemical Syntheses
- Use Safer Solvents/Reaction Conditions
- Increase Energy Efficiency
- Use Renewable Feedstocks
- Design Chemicals and Products that Degrade After Use
- Minimize the Potential for Accidents
- Analyze in Real Time to Prevent Pollution
- Use Catalysts, Not Stoichiometric Reagents
- Maximize Atom Economy
- Avoid Chemical Derivatives

epa.gov/greenchemistry



U.S. EPA Green Chemistry Program

- epa.gov/greenchemistry
- greenchemistry@epa.gov



OECD.org

Data

Publications

More sites

News

Job vacancies



OECD

BETTER POLICIES FOR BETTER LIVES

OECD Home

About

Countries

Topics

Ukraine

> Français

> A to Z

Google Custom search



[OECD Home](#) > [Chemical safety and biosafety](#) > [Risk management of chemicals](#) > Reports on sustainable chemistry

Reports on sustainable chemistry

Promoting the Design, Manufacture, and Use of Environmentally Benign Chemicals Through Sustainable Chemistry (or "Green Chemistry")

OECD Member countries have initiated work on a new project aimed at facilitating the development of environmentally benign chemicals. As a first step, a workshop was held in Venice, Italy (15-17 October, 1998) [ENV/JM/MONO(99)19] to identify effective techniques and approaches in the field of sustainable chemistry and to identify activities that can further the development and use of sustainable chemistry programmes. This includes such things as recognising and rewarding sustainable chemistry accomplishments; disseminating technical information; promoting the incorporation of sustainable chemistry principles into various levels of chemical education; and promoting the research, discovery and development of innovative sustainable chemistry technologies. Work is underway on each of these approaches.

- The Role of Government Policy in Supporting the Adoption of Green/Sustainable Chemistry Innovations [ENV/JM/MONO\(2012\)3](#)



Table 4 ISC3's key characteristics of sustainable chemistry

Holistic	Guiding the chemical science and the chemical sector towards contributing to Sustainability in agreement with sustainability principles and general understanding and appreciating potential interdependencies including long-distance interactions and temporal gaps between the chemical and other sectors.
Precautionary	Avoiding transfer of problems and costs into other domains, spheres and regions at the outset, preventing future legacies and taking care of the legacies of the past including linked responsibilities.
Systems thinking	Securing its interdisciplinary, multidisciplinary and transdisciplinary character including a strong disciplinary basis but taking into account other fields to meet Sustainability to its full extent. Application as for industrial practice including strategic and business planning, education, risk assessment and others including the social and economical spheres by all stakeholders.
Ethical and Social Responsibility	Adhering to value to all inhabitants of plant earth, the human rights, and welfare of all live, justice, the interest of vulnerable groups and promoting fair, inclusive, critical, and emancipatory approaches in all its fields including education, science, and technology.
Collaboration and Transparency	Fostering exchange, collaboration, and right to know of all stakeholders for improving the sustainability of business models, services, processes and products and linked decisions including ecological, social, and economic development on all levels. Avoiding all "green washing" and "sustainability washing" by full transparency in all scientific and business activities towards all stakeholders, and civil society.
Sustainable and Responsible Innovation	Transforming fully the chemical and allied industries from the molecular to the macroscopic levels of products, processes, functions and services in a proactive perspective towards sustainability including continuous trustworthy, transparent and traceable monitoring.
Sound Chemicals Management	Supporting the sound management of chemicals and waste throughout their whole life cycle avoiding toxicity, persistency and bio-accumulation and other harm of chemical substances, materials, processes, products and services to humans and the environment.
Circularity	Accounting for the opportunities and limitations of a circular economy including reducing total substance flows, material flows, product flows, and connected energy flows at all spatial and temporal scales and dimensions especially with respect to volume and complexity.
Green Chemistry	Meeting under sustainable chemistry application as many as possible of the 12 principles of green chemistry with hazard reduction at its core when chemicals are needed to deliver a service or function whenever and wherever this complies with sustainability
Life Cycle	Application of the above-mentioned key characteristics for the whole lifecycle of products, processes, functions and services on all levels, e.g. from molecular to the macroscopic levels and all sectors in a pro-active perspective towards sustainability

The screenshot shows the ISC3 website with the URL <https://www.isc3.org>. The navigation bar includes links for 'Who we are', 'What we do', 'News', 'Trainings', 'Events', and 'Online Atlas'. The main heading is 'Our Vision: Sustainable Chemistry for a Sustainable World'. The text states: 'Sustainable Chemistry facilitates the needs of the present – without compromising the ecological, social and economic needs of future generations.' It further explains that the chemical industry and downstream sectors using chemicals and materials touch nearly every manufacturing and service sector worldwide and are deeply connected with human life. The transformation towards sustainability is key to meet existential global challenges like e.g., climate change, inequality, scarcity of resources. The approach of Sustainable Chemistry connects a circular economy with multifaceted aspects of sustainability and changes stakeholder behavior.

Wait, but aren't green and sustainable chemistry the same thing'? (...) If the two terms were interchangeable, this article would end here. Green chemistry would merely be a more fashionable name for sustainable chemistry; in fact, much more fashionable. (...) However, things are not that simple.

Krasnodębski, Marcin "An unlikely bifurcation: history of sustainable (but not Green) chemistry" Foundations of Chemistry (2023)



FONTE: INTERNET

TUDO CLARO
AGORA ?

ONDE SE INTEGRAM
OS "PINE CHEMICALS"
SUSTENTÁVEIS
AFINAL ?





GrupoRB

GRUPO RB – CORPORATE OFFICE SÃO PAULO

Rua dos Pinheiros, 870, Torre 2000

25 andar, Salas 253/254

Pinheiros - SP | CEP 05422-001 BRAZIL

T. (11) 3087-0696

www.gruporesinasbrasil.com.br

