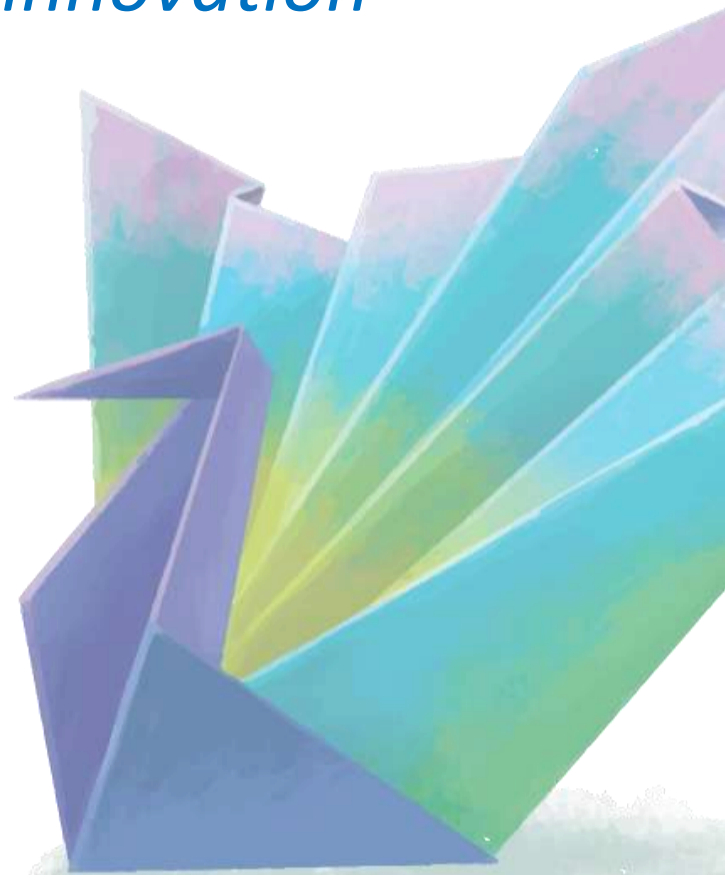
Luminspino

Global trends in climate innovation



25th of July 2023

Cristian Goția

Sustainability milestones

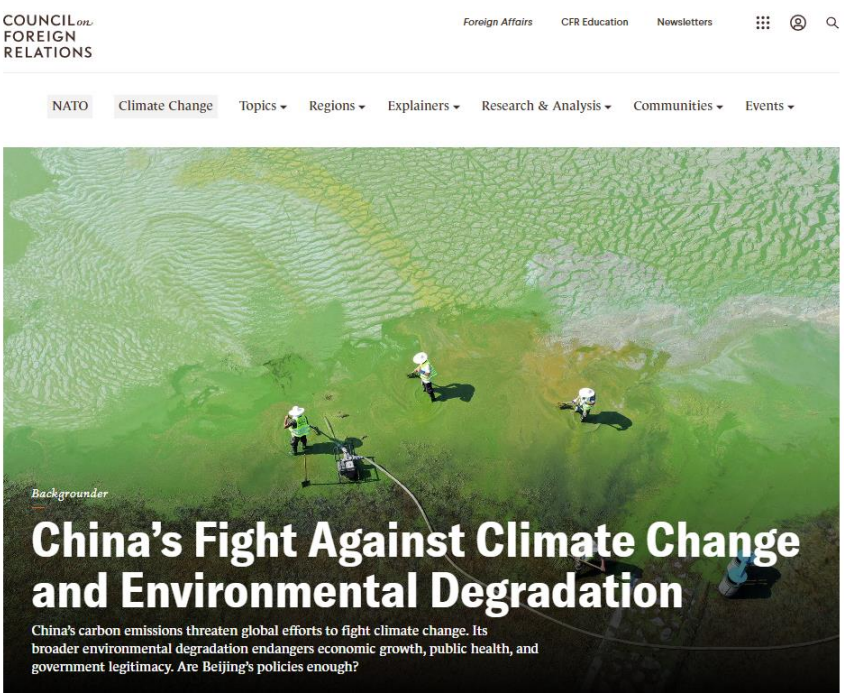
1948	The International Union for the Protection of Nature is founded
1960	The world's population reaches 3 billion
1968	The Club of Rome is established
1972	The UN Conference on the Human Environment – Stockholm The Club of Rome publishes “The Limits to Growth”
1985	The Antarctic ozone hole is discovered
1987	Brundtland Report "Our Common Future"
1999	The global sustainability index is launched
2005	The Kyoto Protocol enters into force
2015	Global food prices increase 43% in 1 year Paris Agreement - “to limit the temperature increase to 1.5°C above pre-industrial levels.”

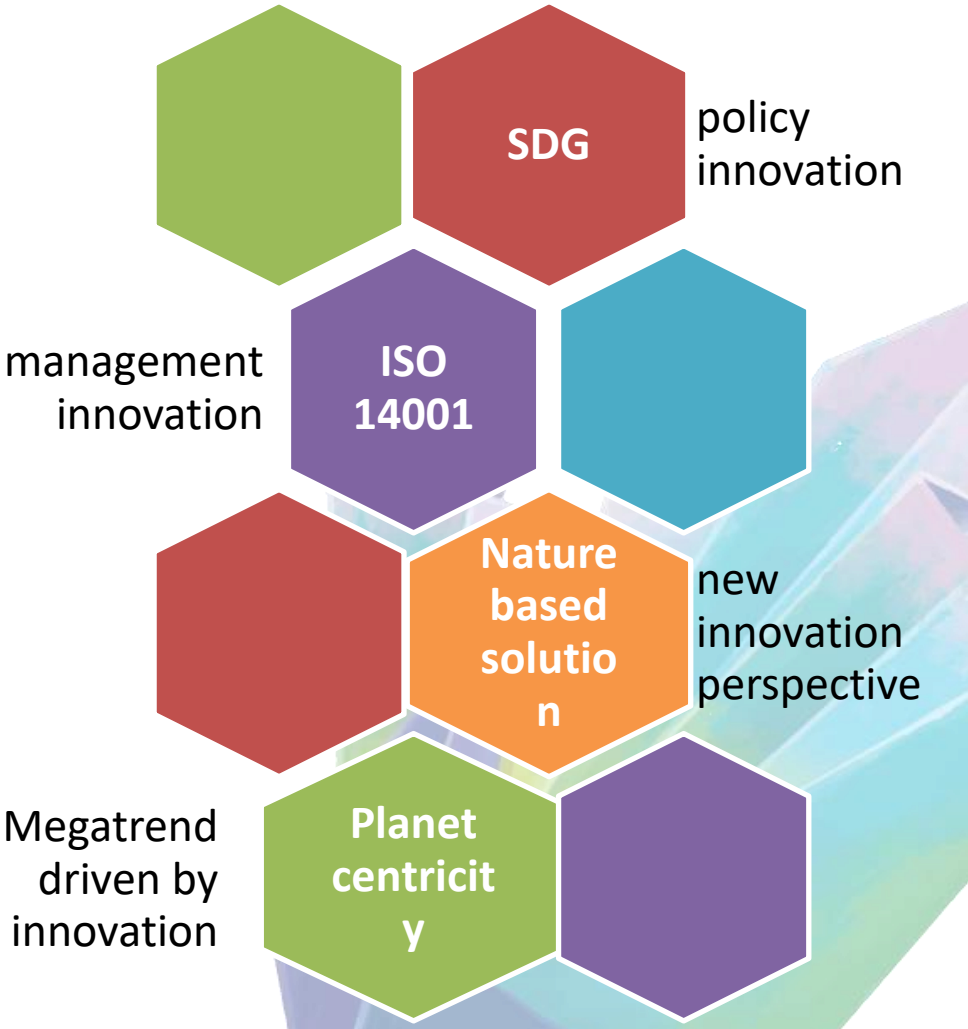
Sustainability an innovation voyage...

- From observation to conceptualization
- From evidence-based facts to measures
- From nature and energy only, to connection with, climate change, social and justice and peace
- Adoption of large-scale solutions (ex.plastic reduction)
- New businesses, consumer behaviour change, increased general awareness

“New research published in the journal Nature Climate Change suggests that 85% of all human beings have already felt the impact of climate change…”

… with a game changer effect



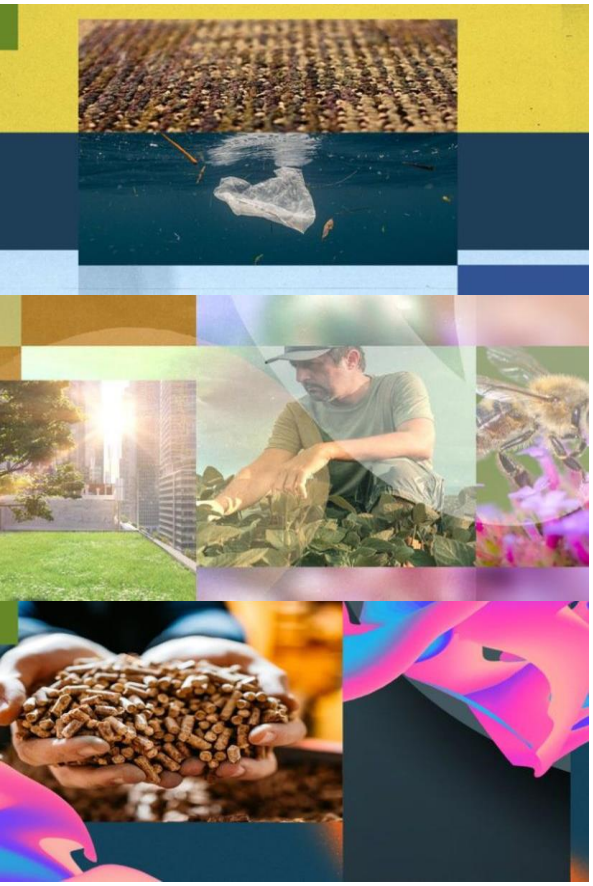


Meanwhile on the market...

"With a new sense of social awareness of the impact of previous human activities, a great many new innovations are emerging. Based on materials, processes and communication, planet-centric issues cover the entire economic spectrum…"

New business based on climate innovation are supporting the sustainability race

…businesses are generating microtrends



Based on macrotrends promoting technologies, practices, logistics and new value focus:

- ❑ Alternative materials (technology focus)
- ❑ Regeneration and Biodiversity
- ❑ Circularity
- ❑ Smart materials
- ❑ Bioengineering

…fueling the climate innovation with market experience.

View Source

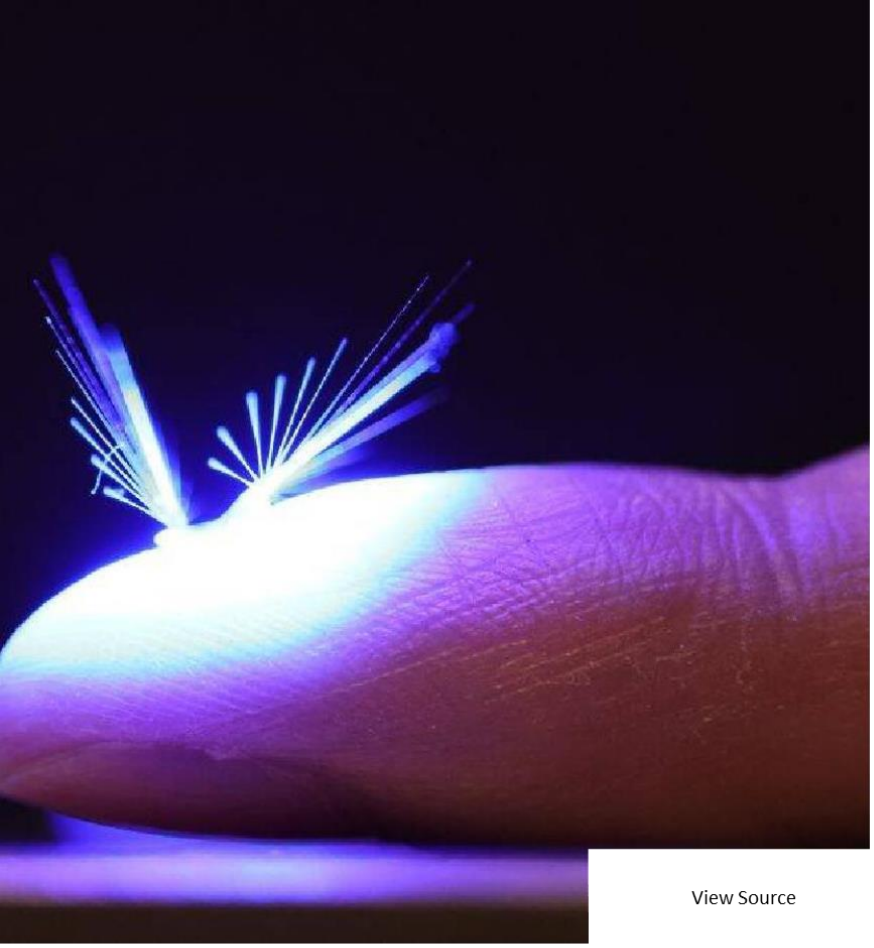
Fairbrics

France

06/02/2023

CO2 net-positive version of polyester fabric

The French start-up Fairbrics wants to replace polyester fabrics with a net-positive version made from carbon dioxide. Currently, 60 percent of textiles, including polyester, are made from synthetic fibers derived from fossil fuels. As a replacement, Fairbrics captures CO2 from industrial sources and combines it with a catalyst and solvent to produce chemicals for polyester production. These are then processed into polyester pellets that can be spun into yarn and fabric. The company is currently scaling up the technology to reach industrial production levels.



View Source

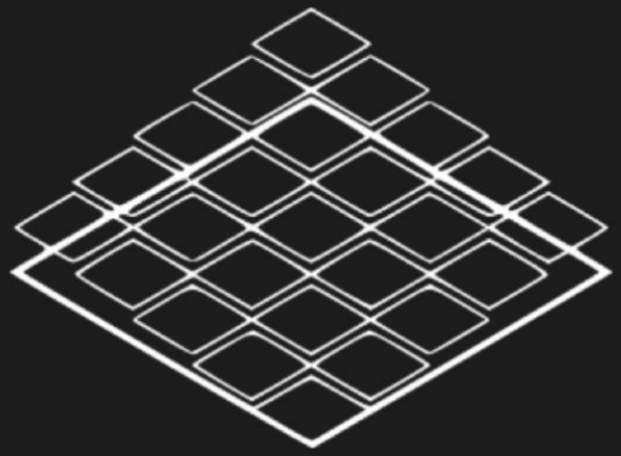
Tampere University of Technology

Finland

02/14/2023

Flying robot used for pollination

Researchers from Tampere University of Technology have developed a flying robot that is inspired by dandelion seeds. It could be used in the future for pollination. The flying robot consists of so-called light-responsive self-assembled materials and it relies on wind to float in the air. The tiny robot is controlled by a light source such as a laser beam or LED. This means that light can be used to change the shape of the robot, enabling it to adapt manually to wind direction. What's more, the light beam can also be used to control the take-off and landing actions.



OSPHERE SOLA

View Source

Biosphere Solar

Netherlands

09/26/2022

Fair and circular solar panels

The global collective Biosphere Solar is developing a fair and circular solar panel. This way, it wants to set a new standard for the solar industry, making circularity the norm. The modular PV design can be disassembled for repair or refurbishment. It can also be recycled at high value at its end-of-life. The main difference to currently available PV modules is the absence of lamination, which is replaced by an edge seal. The hardware is open-source, enabling anyone to contribute to the concept. The aim is for the panel to enter the market in 2024.

View Source

University of Sydney

Australia

05/09/2023

Fungi decompose polypropylene

Researchers at the University of Sydney have developed a method that uses fungi to break down polypropylene. After the team first pretreated the difficult-to-recycle plastic with UV light or heat, two species of fungi commonly found in soil and plants – Aspergillus terreus and Engyodontium album – were able to degrade the plastic by 21 percent within 30 days and by 25 to 27 percent within 90 days. The fungi were added as single cultures to the treated polypropylene. In the process, they produced enzymes that degraded the polypropylene.

View Source

HTEX

Netherlands

10/05/2022

Recycling technology for polyester clothing

The Dutch start-up HTEX has developed a technology that breaks down polyester clothing to its original raw materials. The chemical recycling method developed by the start-up breaks down polyester clothing waste into the original raw materials for polyester: ethylene glycol and terephthalic acid. These can then be made into clothing again. According to HTEX, its technology does in 20 minutes what it would take the earth 20 million years to achieve. HTEX is focusing initially on polyester, but this technology can basically convert all types of textiles into raw materials.

View Source

University of Toronto, University of Waterloo

Canada

06/27/2022

Wood-derived biosensors

Researchers from the University of Toronto and the University of Waterloo have shown how wood-derived materials can be used to harvest electrical energy from everyday movements such as walking. The principle behind this innovation is the triboelectric effect, a form of static electricity. In a new study recently published, the team demonstrated the use of lignocellulosic nanofibrils – derived from tree bark – in a prototype self-powered, biodegradable device that is capable of sending a wireless signal to a smartphone via bluetooth.

Coming back…

All examples are great examples of climate innovation

There could be ~~more out there but…~~

- ❑ **Are they going to reach the market?**
- ❑ **Embraced by the clients/consumers?**
- ❑ **Innovation has no "Limits to Growth"**

This is our work in this project

"disruptive technology should be framed as a marketing challenge, not a technological one." (Clayton M. Christensen, The Innovator's Dilemma)

Luminspino

Thank you!

Cristian Goția

Chief Quality Officer

Luminspino

https://luminspino.eu/