



Bioeconomy, Food and Nutrition Security

Thomas Arnold
Advisor Sustainable Bioeconomy – DG RTD

XXX EURAGRI conference, Tartu 26 September 2016
**“The bio-economy – challenges and implementation – the
research organizations’ perspective”**

“The bio-economy – challenges and implementation – the research organizations’ perspective”

iPad 03:49 100%

slideshow.net

VUCA Prime

thanks to Bob Johansen / Institute of the Future

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- 1. Bioeconomy**
- 2. Food and Nutrition Security**
- 3. Concluding thoughts**

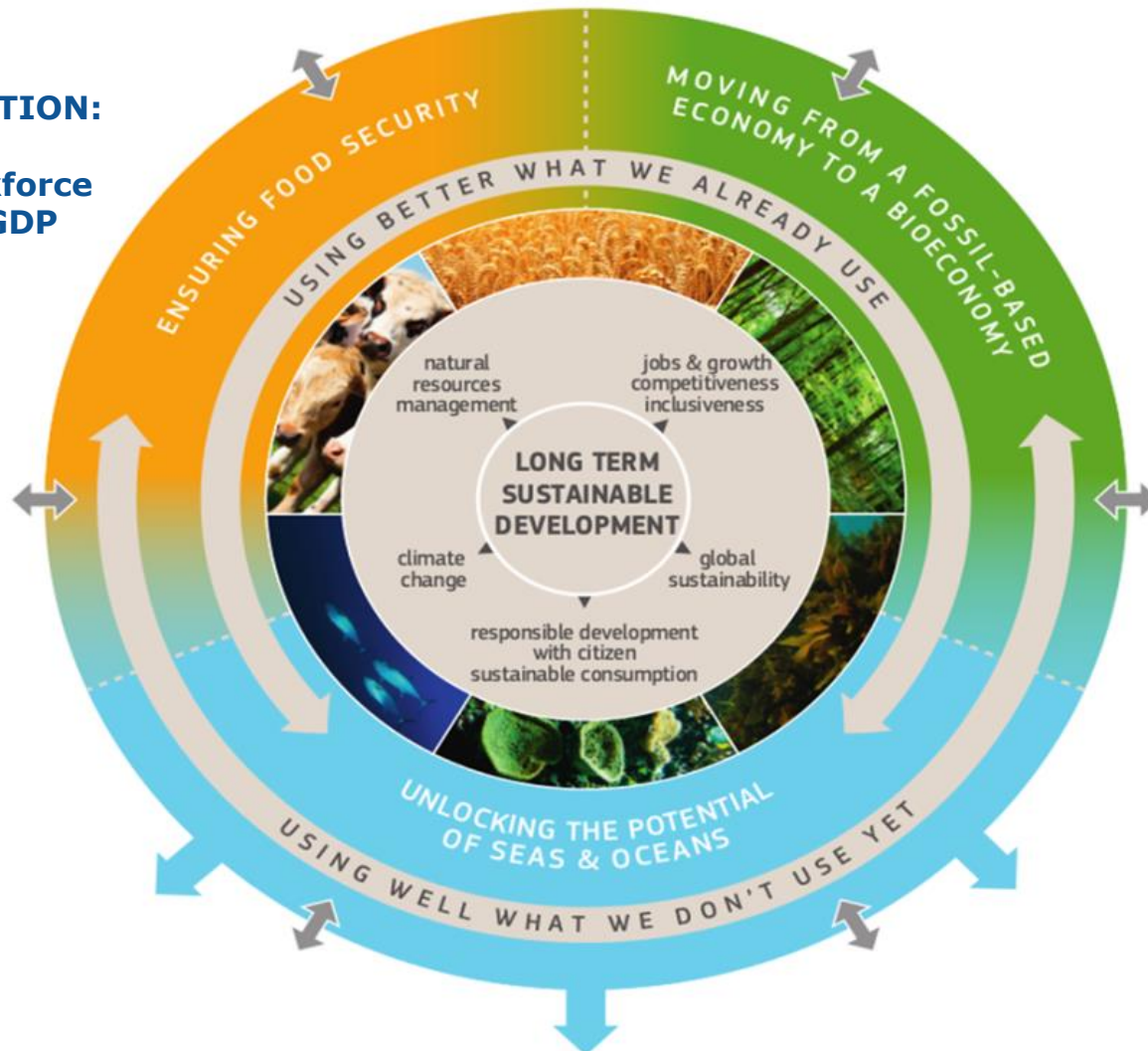


European
Commission

The Bio-Economy

FOOD & NUTRITION:

1/5 of EU workforce
6% of EU's GDP



2. EU context



1. A new boost for jobs, growth and investment

2. A connected digital single market

3. A resilient Energy Union with a forward looking climate change policy

4. A deeper and fairer internal market with a strengthened industrial base

5. A deeper and fairer EMU

6. A reasonable and balance free-trade agreement with the U.S.

7. An area of justice and fundamental rights based on mutual trust

8. Towards a new policy of migration

9. A stronger global actor

10. A Union of democratic change





European
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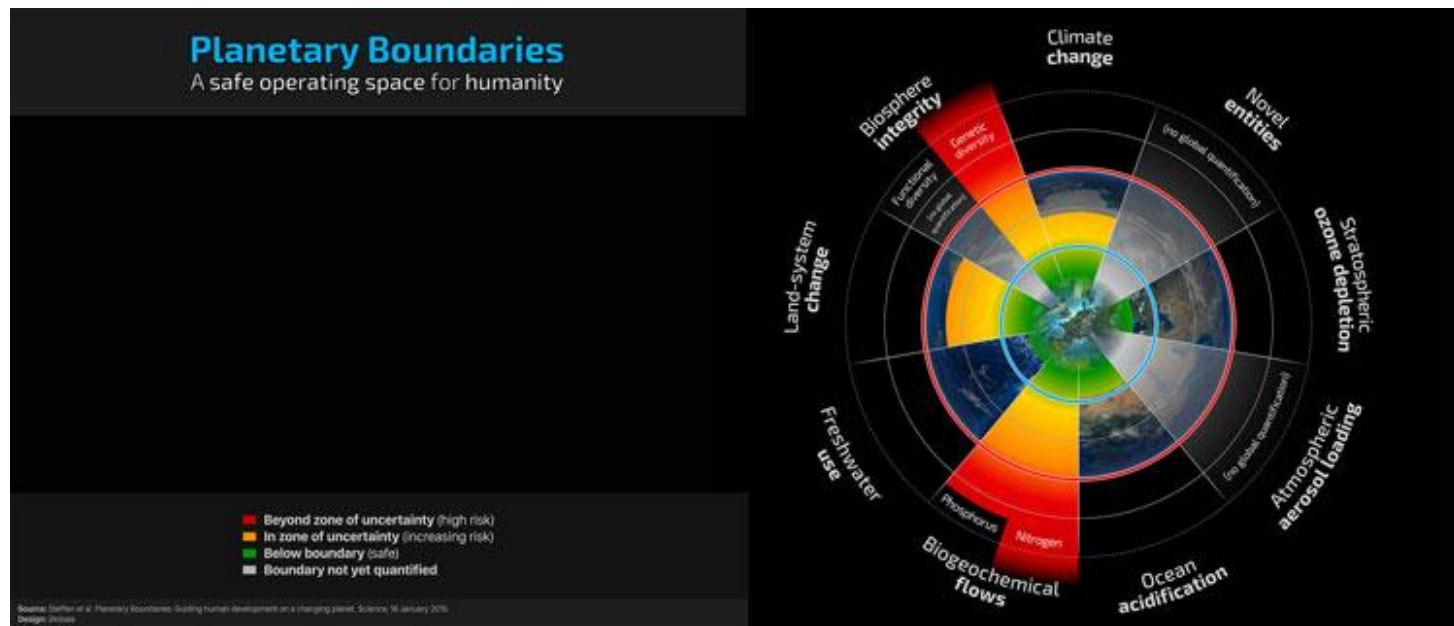
SDGs – All directly or indirectly relevant to bioeconomy or FNS



Planetary Boundaries 2.0 - All crossed boundaries relate to bioeconomy and FNS

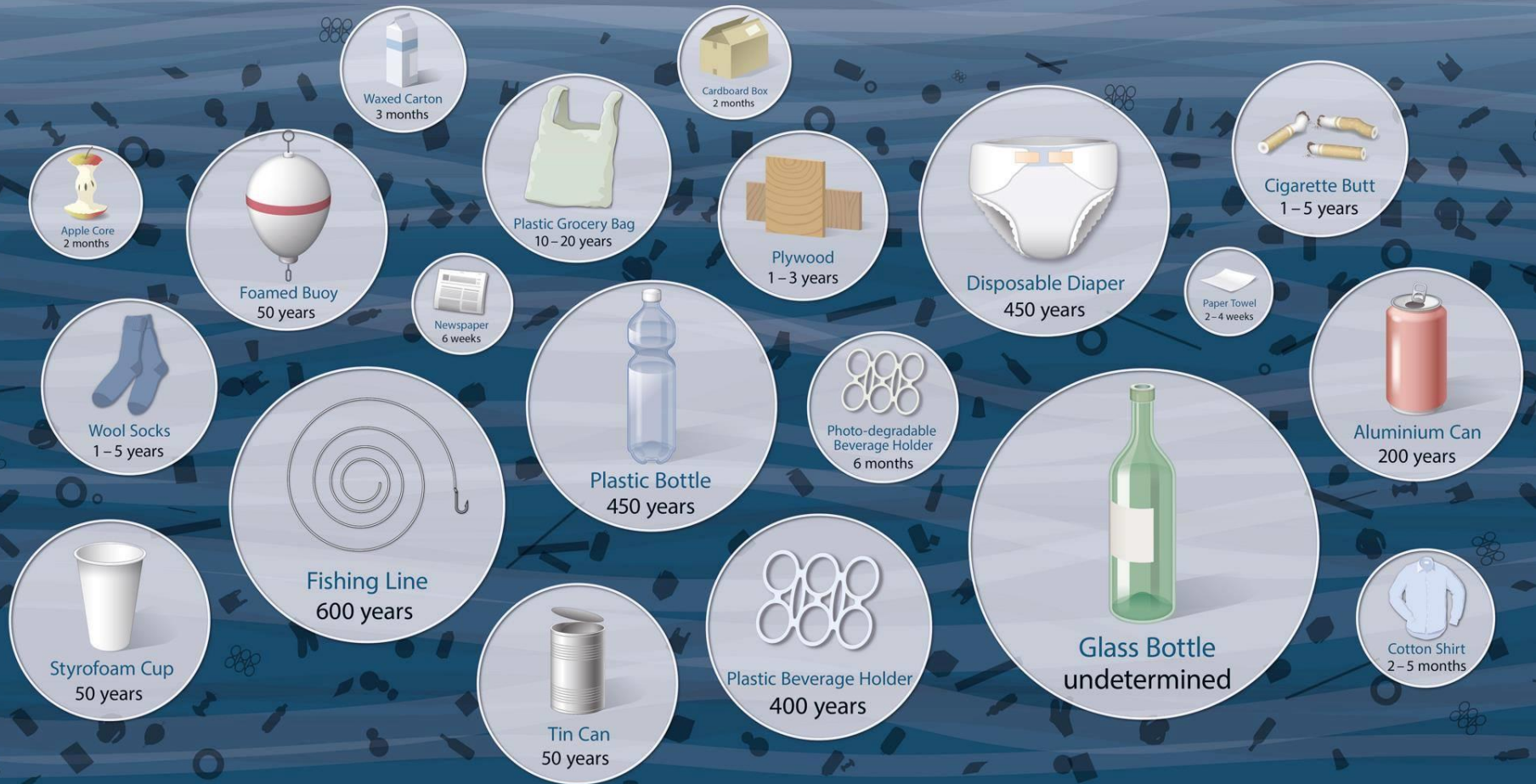
"As Science publishes the updated research, four of nine planetary boundaries have been crossed

Four of nine planetary boundaries have now been crossed as a result of human activity, says an international team of 18 researchers in the journal Science (16 January 2015). **The four are: climate change, loss of biosphere integrity, land-system change, altered biogeochemical cycles (phosphorus and nitrogen).**"
Stockholm Resilience Centre



HOW LONG UNTIL IT'S GONE?

Estimated decomposition rates of common marine debris items



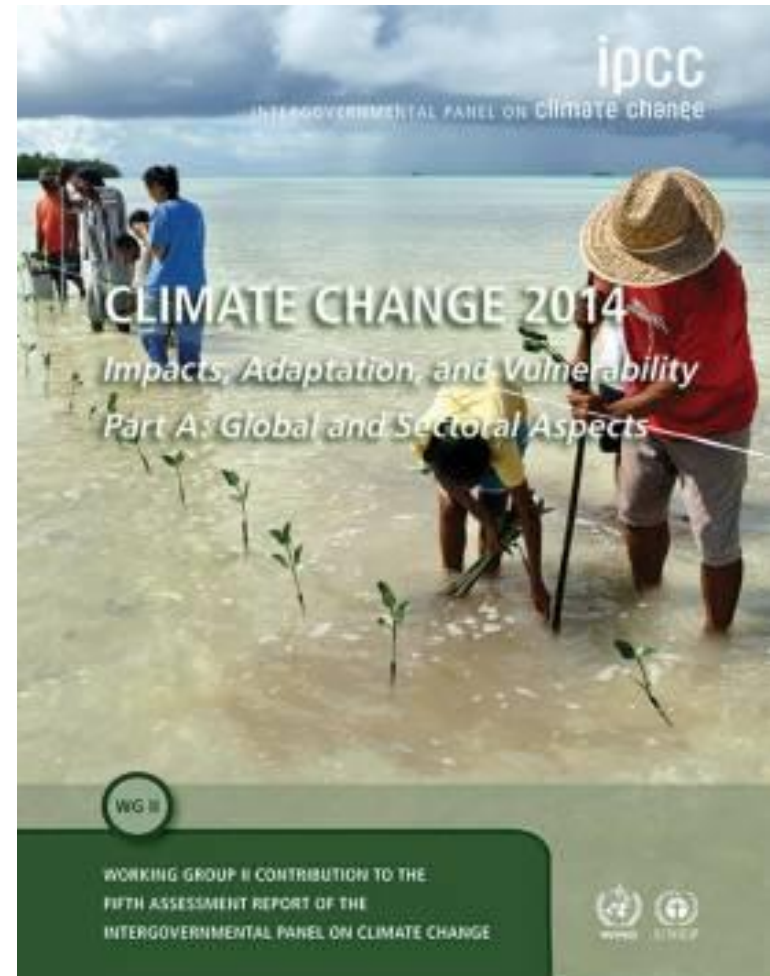
Estimated individual item timelines depend on product composition and environmental conditions.

Source: NOAA (National Oceanic and Atmospheric Administration), US / Woods Hole Sea Grant, US
Graphics: Oliver Lüde / Museum für Gestaltung Zürich, ZHdK

Food is first to be hit by climate change, possibly badly

“Increasing magnitudes of warming increase the likelihood of severe, pervasive, and irreversible impacts.[...] Global climate change risks are high to very high with global mean temperature increase of **4°C** or more above preindustrial levels in all reasons for concern (Assessment Box SPM.1), and include **severe and widespread impacts on unique and threatened systems, substantial species extinction, large risks to global and regional food security**, and the combination of high temperature and humidity **compromising normal human activities, including growing food or working outdoors in some areas for parts of the year (high confidence).**”

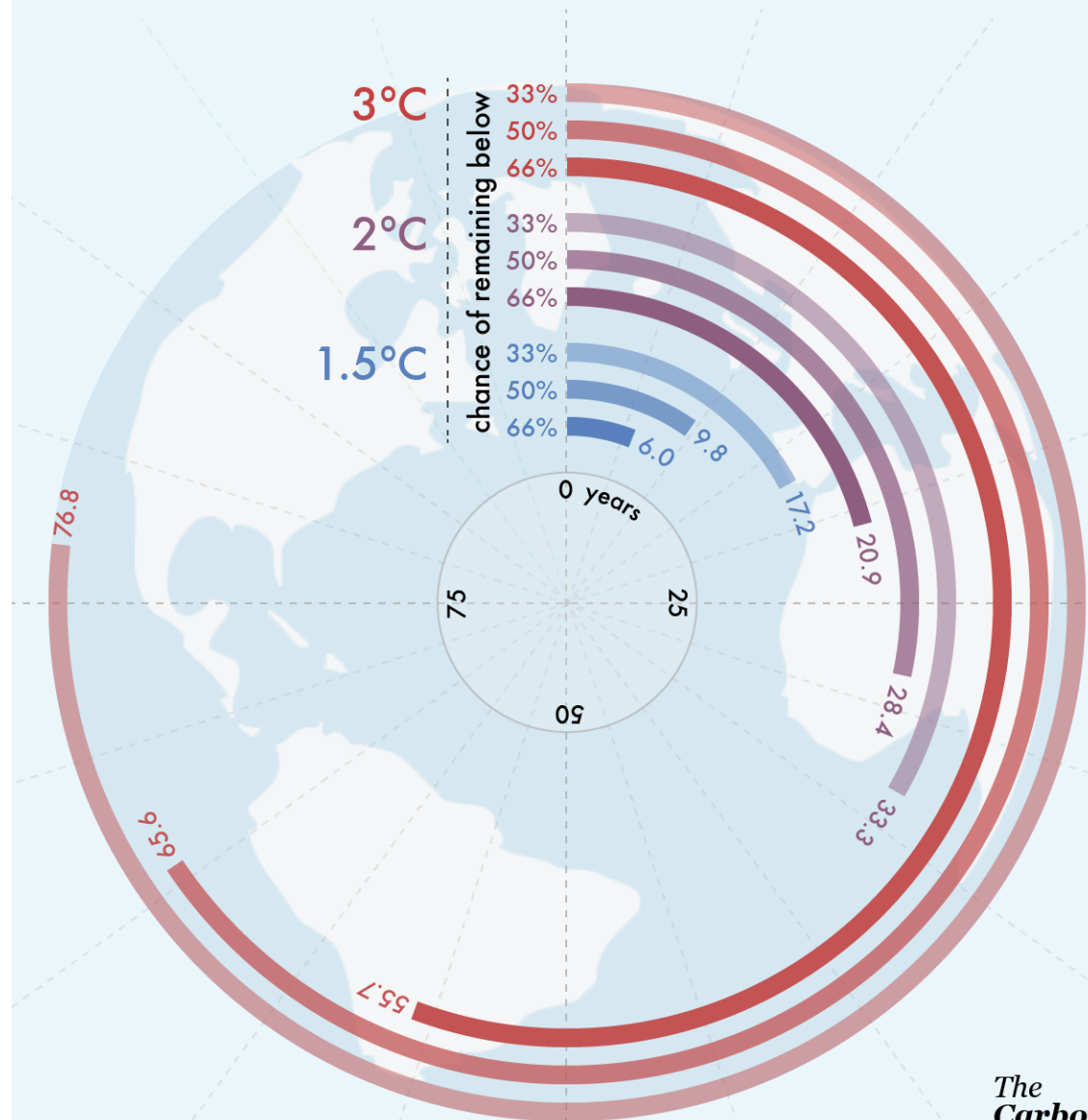
IPCC, Climate Change 2014: Summary for policymakers.



Carbon Countdown

How many years of current emissions would use up the IPCC's carbon budgets for different levels of warming?

- **Six years left to remain confidently (66%) below 1,5°C with current emission levels**
- **21 years to remain below 2°C**
- **3°C warmer in 2070**



<http://www.carbonbrief.org/the-ipccs-priorities-for-the-next-six-years-1-5c-oceans-cities-and-food-security>

<http://bit.ly/carboncountdown>

COP21: The role of bioeconomy

- Deep de-carbonisation not possible without the bio-economy:
 - Replacement of fossil resources for energy, fuels, chemicals, materials (plastics) by sustainably produced biomass and waste – within planetary boundaries without compromising food security
 - Biomass production (agriculture) is major source of GHG emissions (mainly ruminants; fertilizer production) but also possible sink of CO₂ (forestry, soils, CCU)
 - Major innovations needed to address deep de-carbonisation in bioeconomy
- Energy Union Research, Innovation and Competitiveness Strategy (EURICS)

Bioeconomy and Circular Economy

The Bioeconomy Strategy is of high relevance to the CE package:

- The package includes sectorial chapters on "biomass and bio-based products" and on "food waste";
 - The package includes as an action **"the assessment of the contribution of the 2012 Bioeconomy Strategy to the circular economy and to update the Strategy if necessary"**;
 - Proposal to make the separate collection of bio-waste mandatory under conditions, and to ban the landfilling of separately collected waste.
- *Other relevant bioeconomy aspects for the circular economy are sustainable production, biodegradability, use of bio-waste, new circular value chains, etc.*

EU Bioeconomy Action Plan

Investment in R&I



Policy interaction & stakeholder engagement



Enhancement of markets and competitiveness in bioeconomy



- Horizon 2020
 - 3.8 bn €
- Increase multi-disciplinary & cross-sectoral R&I
- Smart Specialisation
- EFSI

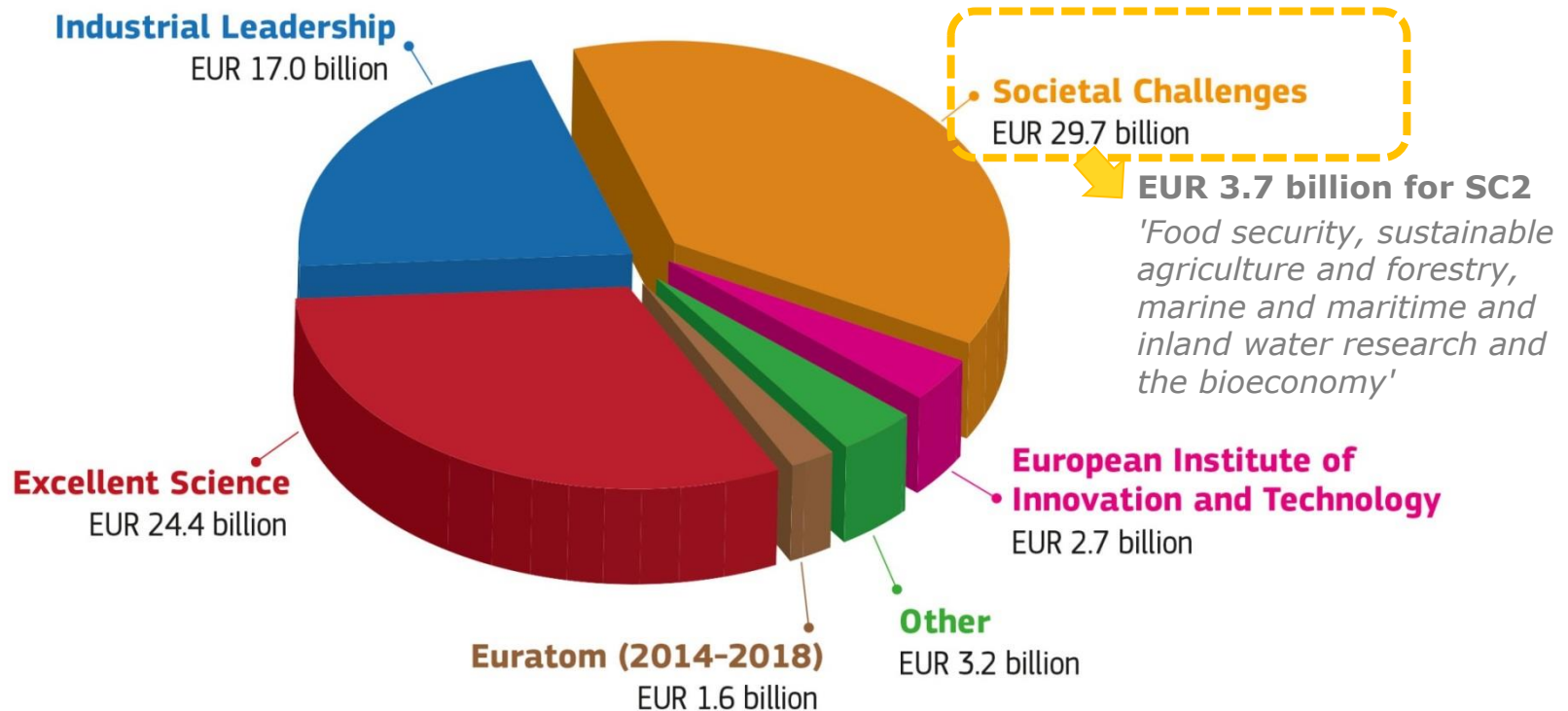
- Bioeconomy Panel
- Bioeconomy observatory
- EU Policy coherence
- Development of regional and national bioeconomy strategies
- International cooperation

- Sustainable intensification of primary production
- Expansion of new markets
- Increase EU competitiveness
- BBI JU
 - 3.5 bn €

Funding Research & Innovation

HORIZON 2020 BUDGET (in current prices)

For period 2014-2020



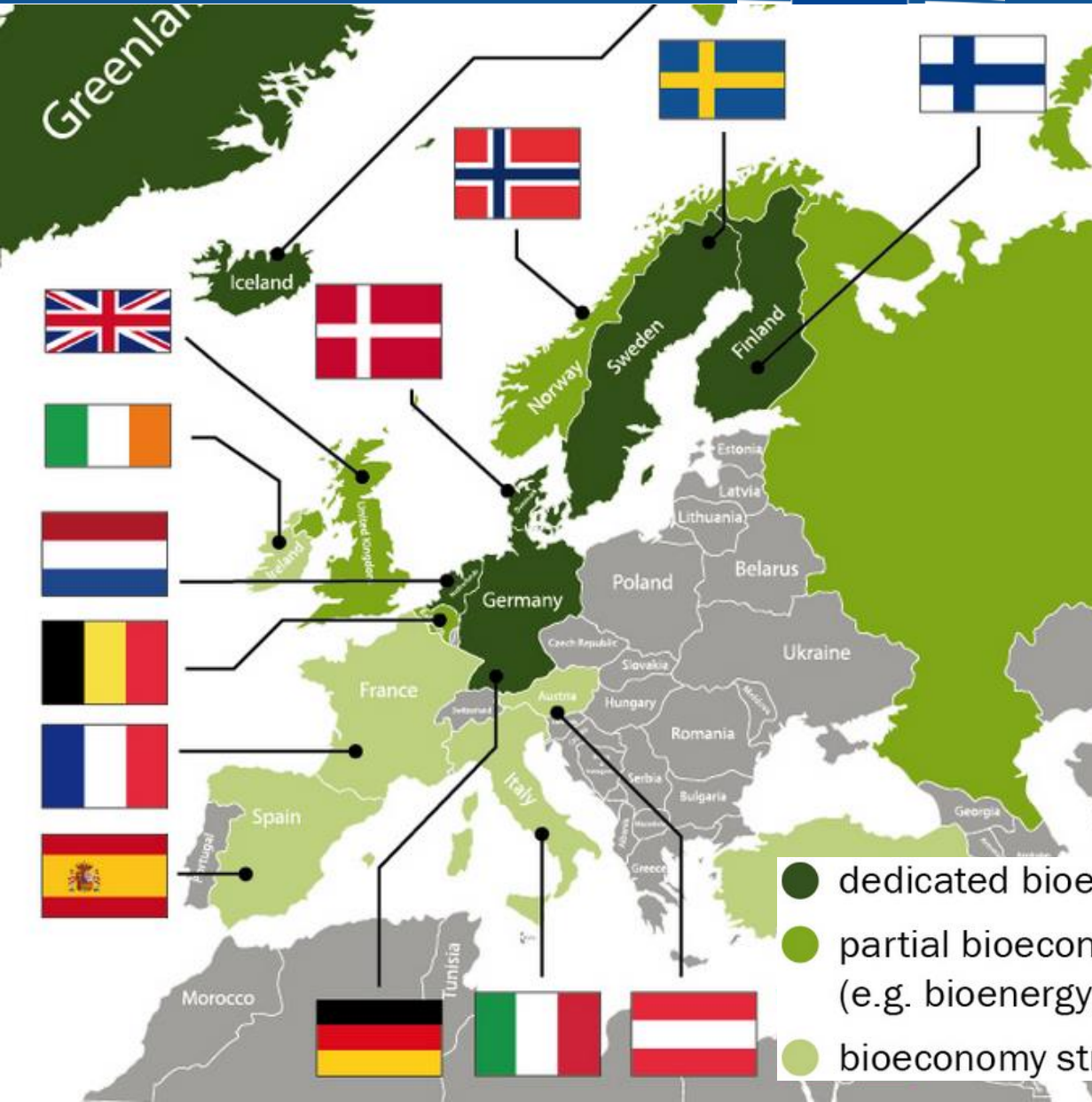


INVESTMENT: €3,7bn BioBased Industries Public-Private partnership 2014-2020

- €975 million of EU funds (Horizon 2020), leveraging €2.7 billion of private investments
- Value Chains: Forest, Woody, Agri, Municipal, Energy, Marine
- Demonstrators, breakthrough research, Flagships



Source: German Bioeconomy Council, Maisei/fotolia.com (flags), jktu_21/fotolia.com (world map)



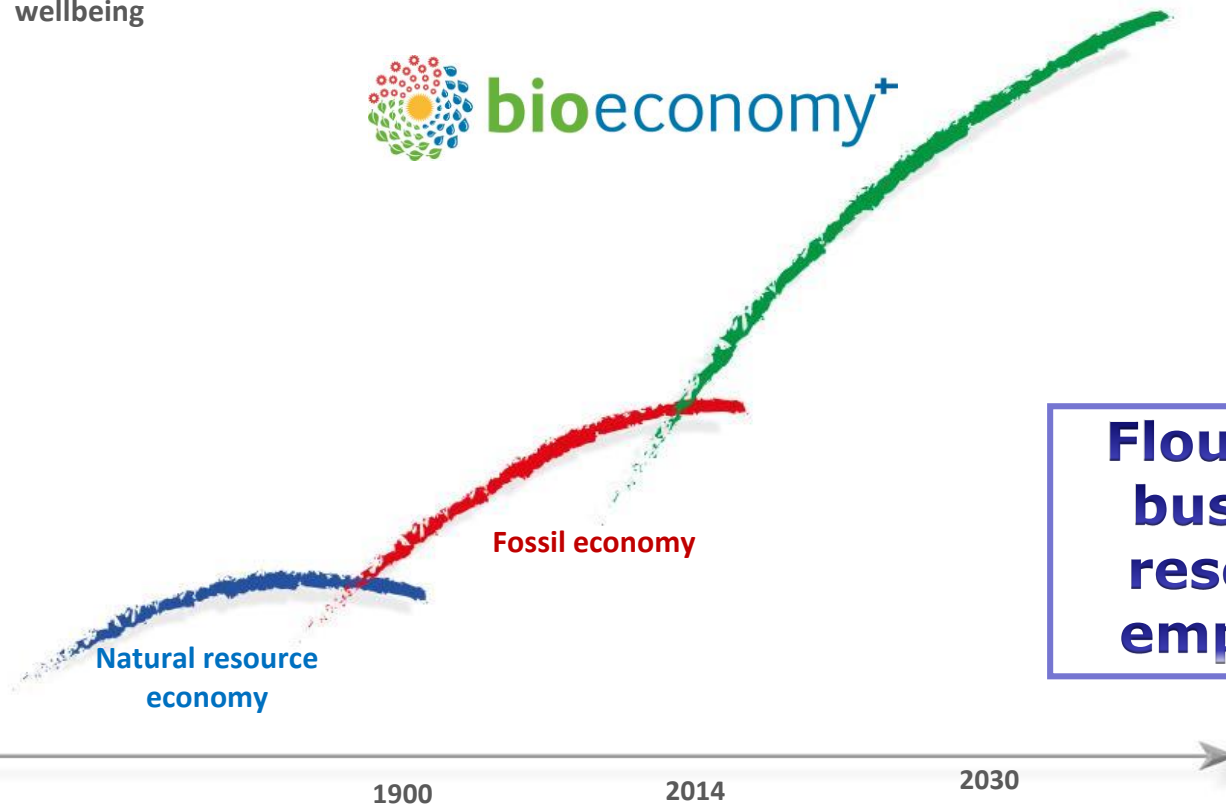
POLICY: Member States & regions are working towards integrated bioeconomy strategies

- dedicated bioeconomy strategy
- partial bioeconomy strategy (e.g. bioenergy, bioindustry, regional strategies)
- bioeconomy strategy under development

GDP and
wellbeing

Sustainable
development

Non-fossil,
post-petroleum
society



**Flourish local
businesses,
resources &
employment**

Engagement stakeholders: 4th Bioeconomy Stakeholders Conference

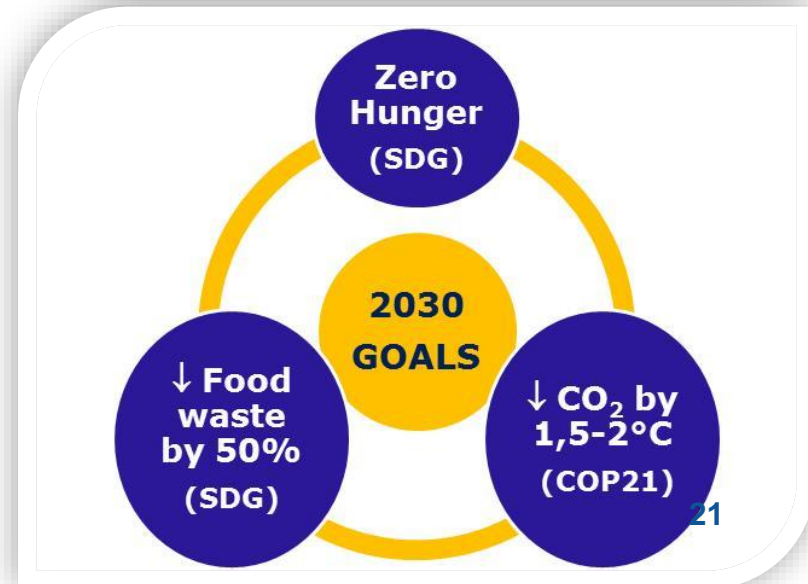
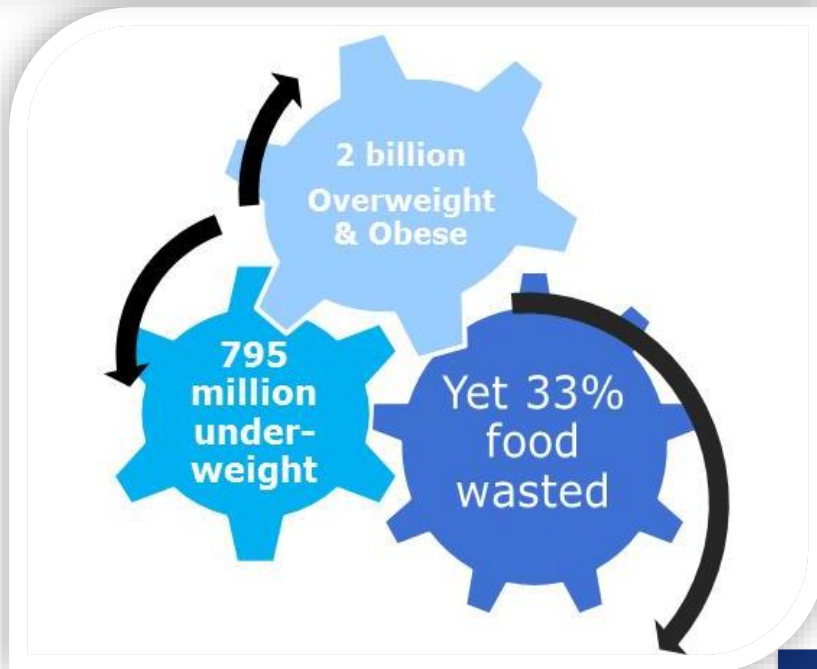
- *To foster buy-in from **all** stakeholders*
- *As outcome a concept **Bioeconomy Stakeholders' Manifesto** that lists key:*
 - **Challenges and opportunities, Guiding Principles, Actions**
- *Actions focusing primarily on contributions stakeholders themselves can make*
- *Deliberated upon by the renewed Bioeconomy Stakeholders' Panel*

- **2017 Building Europe's Bioeconomy – a strategy for sustainable innovation, re-industrialisation**



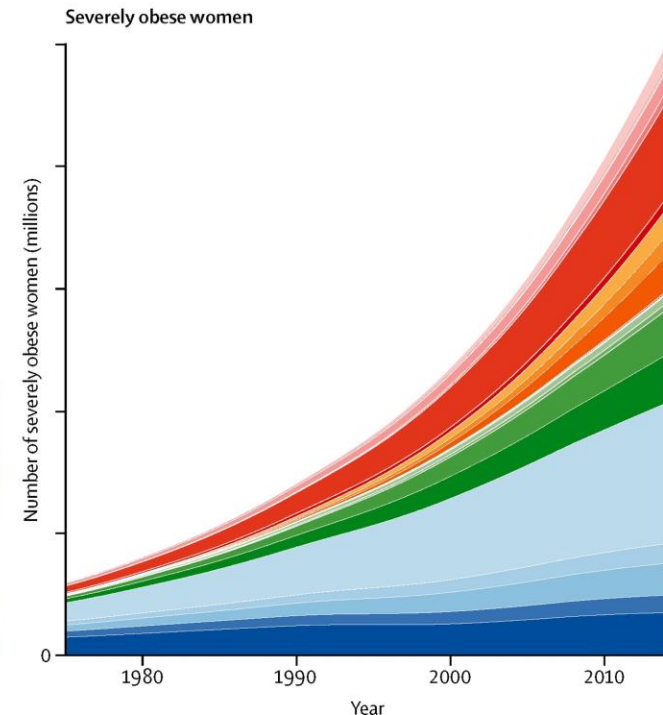
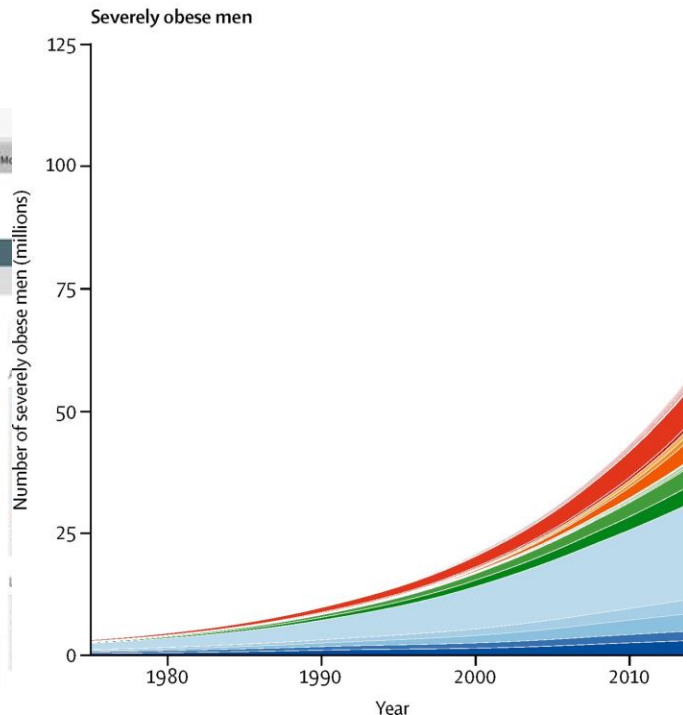
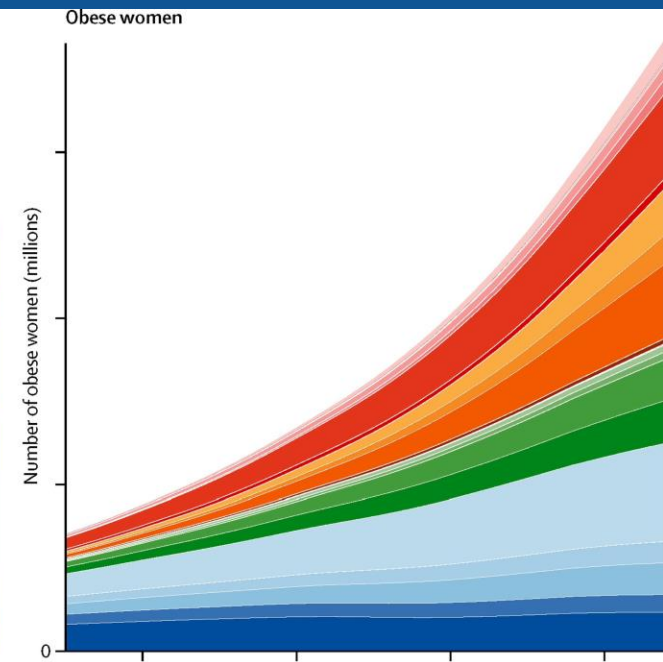
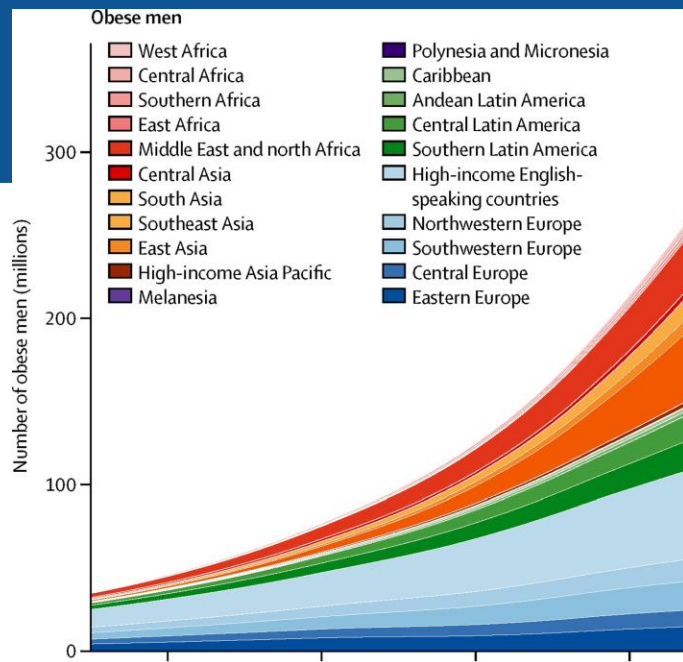
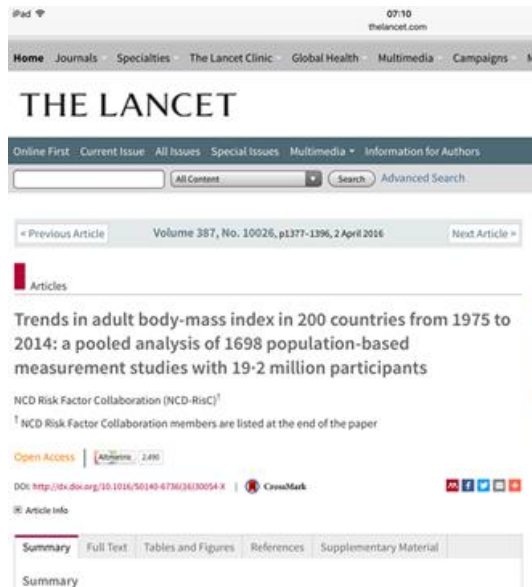
Research and Innovation
Future-proofing our **Nutrition** and **Food Systems**

Nutrition & Food Systems face "perfect storm"



Today globally more obese than undernourished (Lancet 2016)

With current trends zero chance to meet obesity targets





European Commission



Political Opportunity

Juncker Priorities

10 priorities

- | | | | | | |
|----|--|--|----|--|--|
| 01 | | A new boost for jobs, growth and investment. | 06 | | A reasonable and balanced free trade agreement with the United States. |
| 02 | | A connected digital single market. | 07 | | An area of Justice and Fundamental Rights based on mutual trust. |
| 03 | | A resilient Energy Union with a forward-looking climate change policy. | 08 | | Towards a new policy on migration. |
| 04 | | A deeper and fairer internal market with a strengthened industrial base. | 09 | | Europe as a stronger global actor. |
| 05 | | A deeper and fairer Economic and Monetary Union (EMU). | 10 | | A Union of democratic change. |

Sources: European Parliament, European Commission

SDGs Post-2015



COP21



World Food Day 2016

Climate is changing.

Food and agriculture are too.

IPCC



Opportunities for R&I Breakthroughs

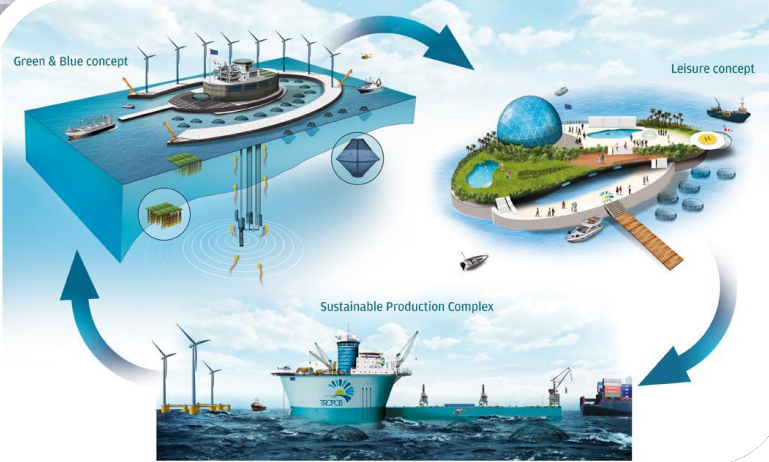
Swarm-robotics
Aquaponics Re-use-of-food-waste
Climate-resilient-crops Smart-Personalised-nutrition
Food-fortification Biosensors-in-agriculture
Organics Smart-Precision-Farming New-food
Multifunctional-business-models Scaling-up-aquaculture
Artificial-Photosynthesis Insects Food-water-health-energy-nexus
Drone-food-delivery Alternative-sources-of-protein
Off-shore-agriculture Food-industry-innovation
Urban-agriculture Plant-based-meat-similars
Sustainable-food-cities 3-D-food-printing
Business-models Soil-carbon-capture Plant-protection
Microbiome Agroforestry
Circular-farms



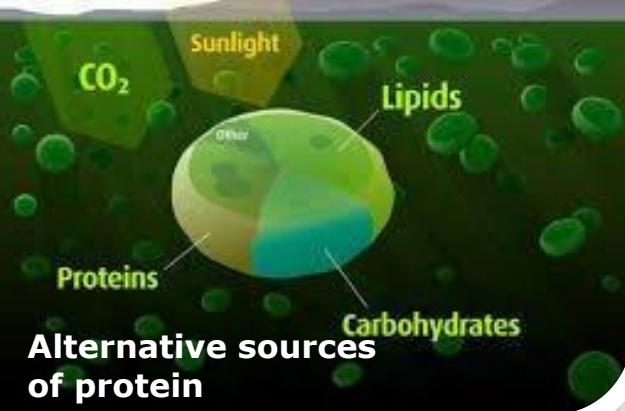
European
Commission

The Innovation Opportunity

Lab grown hamburger



The Algae Biofactory



© Hochschule Weihenstephan-Triesdorf, 2014, 3D printed peas

The Investment Opportunity

- EU Industrial R&D Investment gap persists despite challenges and opportunities (JRC, FoodDrinkEurope, EC)
 - Overall corporate R&D intensity gap widens (2005-2013)
 - Low investment in EU R&D food industry vs. US and Japan
 - Low uptake of EFSI by EU agri-food sector
- Studies show it would have been profitable to have invested more in Agricultural R&D (OECD, Purdue University)
- At the same time:
 - Cost (to society and business) of not acting is high
 - Global venture capital investments into agri & food increased from 0.9 to 4.6 bln USD (2013-2015, AgTech Funding Report 2015)

FOOD 2030

1. To promote a **systems approach** to research and innovation,
2. To better **structure, connect and scale-up EU R&I**, in a global context
3. To **step-up EU investment** ambition (public and private)
4. To mobilise international stakeholders to **tackle global societal challenges**

**NEED FOR NEW LEVEL OF AMBITION,
IMPACT AND FOCUS**

FOOD 2030 Priorities



Nutrition: Reducing hunger & malnutrition, addressing food safety and diet-related diseases, and helping citizens adopt sustainable diets and healthy lives



Climate: Building a climate and global change-resilient food system



Circularity: Implementing sustainability and circular economy principles across the whole food system



Innovation: Boosting market creating innovation and investment, while empowering communities

FOOD 2030 Drivers



Open Innovation -> Investment, Regional, Private sector collaboration (e.g. Smart Specialization Agri-Food Platform)



Open Science -> Open access and data sharing; engagement, education & skills (e.g. Microbiome)



Research Breakthroughs -> ICT, Food systems science & transdisciplinarity (e.g. smart personalised nutrition, consumer behaviour, multi-actor approach)



Open to the world -> Global collaborations; MS R&I alignment and support (e.g. International Bioeconomy Forum, ASEAN aquaculture)

Participate in FOOD2030-debate

By joining the FOOD2030 conference

12-13 October 2016, Brussels (webstreaming available)

- Participation of Commissioners Moedas & Hogan confirmed
- P. Bulcke (CEO Nestlé) confirmed
- Innovators, entrepreneurs, panels on nutrition for healthy and sustainable diets, climate-resilience and circularity, investments & innovation.

<http://ec.europa.eu/research/conferences/2016/food2030>

 **#FOOD2030EU**

By engaging with us to share your ideas

Perspective of research organisations

Some checkpoints for implementation

- **System approach** (e.g. food system, connecting land and sea, etc.) to capture complexity, interconnectedness and holistic perspective
- **Inter- and transdisciplinary cooperation** to break up silos
- **Embedding social sciences & humanities** to ascertain societal relevance and consider socio-economic and cultural dimensions
- **Connecting or converging with ICT** to unleash potential of digital revolution
- **Linking and integrating research with innovation** (all types of innovation including technological, social, business model, governance, institutional, etc.) to create solutions for products, processes, services, policies, etc.
- **Multi-actor approach** and beyond to embrace perspectives of multiple stakeholders
- Stronger **engagement with and of citizens** to enhance co-creation and societal acceptance
- Public-private cooperation, possibly with involvement of **new actors and young crowds**, to unleash disruptive and market creating innovation
- Moving **results to market, policies or society** to develop job and growth opportunities and enhance impact on tackling global societal challenges



Concluding thoughts

Drivers for success

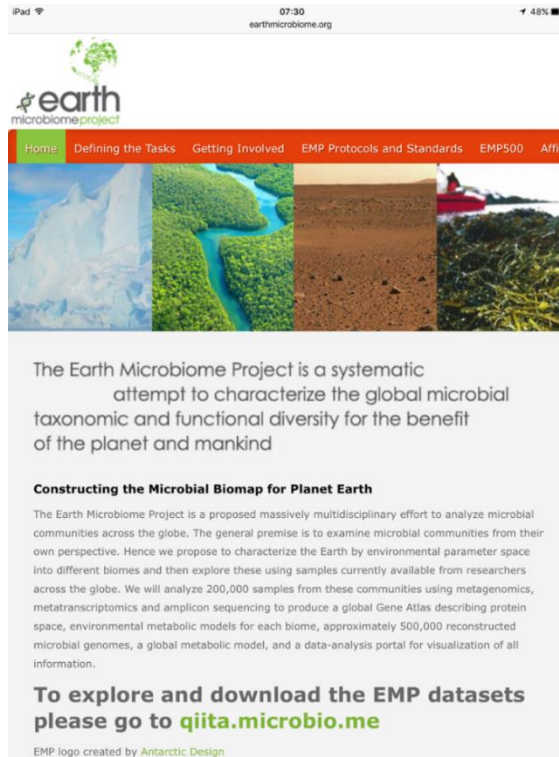
Research Breakthroughs

Example

Microbiome



Understanding the
microbiome of our biosphere



The screenshot shows the Earth Microbiome Project website. The header includes the logo and navigation links: Home, Defining the Tasks, Getting Involved, EMP Protocols and Standards, EMP500, and Affilia. Below the header is a banner image showing various natural environments. The main text reads: "The Earth Microbiome Project is a systematic attempt to characterize the global microbial taxonomic and functional diversity for the benefit of the planet and mankind". A section titled "Constructing the Microbial Biomap for Planet Earth" describes the project's goal to analyze microbial communities across the globe. At the bottom, it says "To explore and download the EMP datasets please go to qiita.microbio.me".



The screenshot shows a Live Science article titled "Why It's Time to Map the Microbiome (Kavli Roundtable)". The article is by Alan Brown, The Kavli Foundation, dated December 2, 2015. It features a section titled "EXPERT VOICES" with a sub-header "OP-ED & INSIGHTS". The article discusses the importance of mapping the microbiome and mentions the Kavli Foundation's support for this effort. It also includes a quote from Alan Brown: "Microbes make life on Earth possible, yet we know so little about them. Now, a team of scientists aim to change that through an ambitious effort — with researchers from 50 institutions — called the Unified Microbiome Initiative." The article concludes by stating that the goal is to develop next-generation technologies to unlock the secrets of microbiomes.

08:17 plantixportal.com

Plastixportal
Plastics & Packaging Directory South Africa

Listing Options | Plastics News

CONVERTERS | PRODUCTS | PACKAGING | MATERIALS | MACHINES | Moulds | SERVICES

4th Conference on Carbon Dioxide as Feedstock for Fuels, Chemistry and Polymers

Highly efficient and cost-effective CO2 utilization will spark a revolution

Published: 2015-06-25

Premium

MBSA

4th Conference on CO2
29 - 30 September 2015
Haus der Technik, Essen (Germany)
www.co2-chemistry.eu

Highly efficient and cost-effective CO2 utilization will spark a revolution - Leading players will showcase their latest technological breakthroughs in Essen (Germany)

novae-Institute is proud to host the "4th Conference on Carbon Dioxide as Feedstock for Fuels, Chemistry and Polymers" on 29 - 30 September 2015 in Essen, Germany (http://co2-chemistry.eu) and invites interested stakeholders to register. More than 200 experts are expected to join Europe's largest event on Carbon Capture and Utilization (CCU). The main focus of the conference topic is on technological

22:48 eflation.com



Disruptive innovation

creating new markets

22:48 eflation.com

CON STYLE

Spreading like wildfire: Why wooden skyscrapers are springing up across the world

By Jenni Marsh, CNN
Updated 06:44 GMT (14:44 HKT) April 27, 2016



Aquaculture: Growup Urban Farms (London)
http://growup.org.uk/growup-urban-farms

22:20 weburbanist.com

weburbanist

€40 / maand excl btw
gedurende 12 maanden

13:19 horizon-magazine.eu

HORIZON
The EU Research & Innovation Magazine

New Articles Daily on Urban Architecture, Art, Design, Travel, & Technology

World's Largest Indoor Farm is 100 Times More Productive

Article by Urbanist, filed under Offices & Commercial in the Architecture category.

ENVIRONMENT

High hopes for houses made from hemp

15 September 2016 KEY THEME: BIOECONOMY

proxiplus TV Replay est maintenant disponible pour tous!

Los Angeles Times

Start-up turns methane from manure into eco-friendly plastic

Reach Higher, Savor every sip.

High hopes for houses made from hemp

15 September 2016 KEY THEME: BIOECONOMY

by Steve Gillman

Hemp can be used to create furniture, roof tiles and even sustainable concrete. Image credit: Pixabay/ rexmedian

A cutting-edge refinery is processing specially bred hemp and researching innovative new biomaterials that could help build future eco-friendly homes.

Hemp has some of the strongest fibres found in nature and was used for thousands of years to make clothes, ropes and ship sails. Then, with the invention of cheap petrochemical fibres, and later strict drug laws, hemp production mostly disappeared, until researchers figured out they could use it to make sustainable biomaterials, and even build houses.

'Hemp is a multi-use crop,' said Dr Stefano Amaducci from the Department of Sustainable Crop Production at the Università Cattolica del Sacro Cuore in Piacenza, Italy.

'The seed is used in animal feed and other food applications, while the stem is transformed through mechanical extraction into fibres and shives (the woody core of the stem) that have many purposes.'

For instance, if you combine hemp fibres and shives with adhesives you can create building materials that in turn could make furniture, roof tiles and even sustainable concrete.

Dr Amaducci is the project coordinator of MultiHemp, an EU-funded

The Issue

Building our homes, offices and basically any urban structure has made construction one of the most resource heavy sectors in Europe.



Market creating regulation, standards, procurement

USDA United States Department of Agriculture

biopreferred.gov

POPULAR TOPICS

- What is BioPreferred?
- Mandatory Federal Purchasing
- Voluntary Labeling
- Biobased Products
- Selling Biobased
- Map of Companies
- Training & Education Resources
- How To Participate

ECONOMIC IMPACT

\$369 BILLION
The amount contributed to the U.S. economy in just one year

\$126 BILLION
The estimated value added from sales of biobased products in 2013

AMERICA'S BIOECONOMY GROWS OPPORTUNITIES

New infographic shows the U.S. bioeconomy is thriving—supporting millions of jobs, driving economic growth, and expanding opportunities for biobased products from America's farms and forests.

I BUY FOR THE FEDERAL GOVERNMENT | I AM A CONSUMER | I SELL BIOBASED PRODUCTS

11:52 sciencealert.com 70%

CERTIFICATION

Our logo – OK biodegradable MARINE
What does it mean?

OK biodegradable MARINE: Guaranteed to biodegrade in the natural environment in the marine environment.

The OK biodegradable MARINE logo provides an answer to business decisions on whether you, the manufacturer, can produce products and ways to make them that are biodegradable in the marine environment.

Being well aware of the alternatives that our customer needs will ensure compliance with OK biodegradable MARINE certification in your marine area.

France just became the first country to ban all plastic plates, cups, and utensils

Go France!
BEC CREW 19 SEP 2016

France just passed a law that says all plastic plates, cups, and utensils will be banned by 2020, and replacements will need to be made from biologically sourced materials that can be composted.



BioBased Economy > Research > Open-Bio > What is the project about?

Open-Bio: Opening bio-based markets via standards, labelling and procurement

Open-Bio is the follow-up project to the FP7 research project called KBBPPS (Knowledge Based Bio-based Products' Pre-Standardization) and kicked off in November 2013. It comprises a broader consortium consisting of the KBBPPS group and a number of new partners, bringing in expanded expertise. Open-Bio builds on the results of KBBPPS, refining them and developing further knowledge on implementation of the standardization result in relation to market development.

Open-Bio investigates how markets can be opened for bio-based products through standardization, labelling and procurement. Therefore, one focus is on the sustainability of the bio-based resources and potential testing methods for this criterion. The end-of-life research will be expanded to different biodegradation scenarios, composting and recyclability. Functionality testing will focus on the gaps identified by KBBPPS and on the special properties of bio-based products.

Project: Open-Bio

News

Partner events:

The results of Open-Bio will be fed directly into the current standardization processes of CEN/TC411.

Public procurement workshop organised by the EC Expert Group on Bio-based Products

intelligentio

Can Green Investment Contribute To Solve The Ecological Crisis ?

Author: Eduardo Rodriguez-Montesinos

Can Green Investment Contribute To Solve The Ecological Crisis ?

More and more people are becoming aware of a fundamental conflict between economic growth and environmental protection. Governments, organizations, and society in general, have finally come to terms to the necessity of raising awareness and finding solutions to this core issue of current times. Page Francis's recent speech to the United Nations (2015) on ecology and climate change, and the **WEP's global risks** report, launched last January (2016) in Davos, are paradigmatic of the widespread level of concern.



Future-proof investments

bcg.perspectives

Investors Care More About Sustainability Than Many Executives Believe

MAY 12, 2016 | by Gregory Unruh, David Kiron, Nina Kruschwitz, Martin Reeves, Holger Rubel, and Alexander Meyer zum Felde

CATEGORIES: SUSTAINABILITY STRATEGY

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IN THIS ARTICLE

- BCG and MIT Sloan Management Review's seventh global study on business issues related to sustainability focused on the relationship between investors and managers.
- The study was based on a survey of more than 3,000 executives and managers from more than 100 countries.

RELATED ARTICLES

- SUSTAINABILITY JANUARY 2016 **Joining Forces: Collaborative Leadership for Sustainability**
- SOCIAL SECTOR DECEMBER 2015 **The Journey Toward a Sustainable World**
- SUSTAINABILITY FEBRUARY 2012 **Sustainability as Adaptability**
- SUSTAINABILITY DECEMBER 2011 **Sustainability's Next Frontiers**
- SUSTAINABILITY JANUARY 2012 **Sustainability Nears a Tipping Point**
- SUSTAINABILITY SEPTEMBER 2011 **Redefining the Future of Growth**

Sustainability is increasingly important for investors, as evidence mounts that companies' environmental, social, and governance performance has an impact on long-term financial success.

BCG's seventh sustainability report in collaboration with MIT Sloan Management Review found that 75% of senior executives in investment firms see a company's sustainability performance as materially important to their investment decisions—and nearly half would not invest in a company with a poor sustainability track record. However, only 60% of managers in publicly traded companies believe that good sustainability practices influence investment decisions.

The report, *Investing for a Sustainable Future: Investors Care More About Sustainability Than Many Executives Believe*, is based on a survey of more than 3,000 executives and managers from more than 100 countries.

A key factor in investors' increasing engagement with sustainability is the greater availability of data. In the past, limited access to information forced sustainability-focused investors to take a more exclusionary approach, identifying and shunning companies that harmed the environment. Today's investors, armed with richer data and more sophisticated analytics, can have a more inclusive and nuanced perspective. Furthermore, the ability to access and analyze more data has revealed that sustainability and performance are not mutually exclusive: 75% of investors now think that increased operational efficiency often accompanies sustainability progress.

The disconnect between investors' and managers' perceptions means that too few companies are prepared to attract sustainability-savvy investors. The research showed that although 90% of executives see sustainability as important, only 60% of companies have a sustainability strategy in place, and just 25% have developed a clear sustainability business case that can serve as a compelling story for investors.

The report suggests several steps business leaders can take:

- Build awareness of sustainability challenges and programs—both within companies and among stakeholders, including investors.
- Identify and analyze the material sustainability issues that can affect performance and align the organization to ensure an integrated response.
- Invest in and focus on tangible and measurable sustainability outcomes instead of positions on ratings lists.
- Formulate a sustainability strategy and incorporate it into the overall corporate strategy, including a clear business case.
- Engage investors and a broad range of stakeholders to discuss the company's sustainability strategy and progress.

DOWNLOAD THE FULL REPORT

To Contact the Authors

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David Kiron
Executive Editor, MIT Sloan Management Review's Big Ideas Initiatives

MIT Sloan Management Review

RESEARCH REPORT

IN collaboration with

BCG
The Boston Consulting Group

Investing For a Sustainable Future

Investors see a strong link between corporate sustainability performance and financial performance — so they're using sustainability-related data as a rationale for investment decisions like never before.

By Gregory Unruh, David Kiron, Nina Kruschwitz, Martin Reeves, Holger Rubel, and Alexander Meyer zum Felde

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SUSTAINABLE FUTURE

Investors Care More About Sustainability than Many Executives Believe

May 11, 2016

by: GREGORY UNRUH, DAVID KIRON, NINA KRUSCHWITZ, MARTIN REEVES, HOLGER RUBEL, AND ALEXANDER MEYER ZUM FELDE

Investors see a strong link between corporate sustainability performance and financial performance — so they're using sustainability-related data as a rationale for investment decisions like never before.

1

EXECUTIVE SUMMARY

Many executives embrace the conventional wisdom that mainstream investors care little about an organization's performance on environmental, social, and governance (ESG) metrics. Few companies make it a priority to communicate their sustainability performance to investors, or even develop a robust story about their sustainability performance. Why should they? Investors won't shift their investments, the thinking goes, based on a company's ESG performance. However, a growing number of investors are paying attention to ESG performance, as evidence mounts that

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How vital fish stocks in Africa are being stolen from human mouths to feed pigs and chickens on Western factory farms

Exclusive: With soaring meat consumption around the world, vital omega 3-rich fish stocks destined for human mouths in western Africa are being snatched by foreign food companies to feed factory-farmed animals – and ultimately the populations of wealthier countries

Jim Wickens | Monday 19 September 2016 | 167 comments

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International criminal court

ICC widens remit to include environmental destruction cases

In change of focus, Hague court will prosecute government and individuals for environmental crimes such as landgrabs



A case lodged with the ICC alleges mass rights violations by Cambodian authorities related to land-grabbing. Photograph: Omar Havana/Getty Images

John Vidal and Owen Bowcott
Thursday 15 September 2016 17:46 BST

Responsible business models

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FRA European Agency for Fundamental Rights

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Severe labour exploitation: workers moving within or into the European Union

Q & A

1. **What is severe labour exploitation?**
Working every day of the week for wages that are paid at irregular intervals or not at all, living in cramped substandard conditions isolated from the rest of the community, or working without a contract and continuous threats of deportation are all examples of severe labour exploitation. Formally, 'severe labour exploitation' refers to all forms of labour exploitation that are criminal under the legislation of the Member State in which the exploitation occurs. While only certain forms of labour exploitation are covered by EU criminal legislation, Article 5 of the Charter of Fundamental Rights of the EU prohibits slavery and forced labour, while Article 31 stipulates that all workers have the right to "fair and just" working conditions.

2. **Who are the victims of severe labour exploitation in the EU?**
Victims of severe labour exploitation are workers who endure working conditions that are criminal under the legislation of the country in which it is taking place. Victims of labour exploitation often work in isolation, in the fields, in households or on construction sites. After their employment ends, victims often leave the country in

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JUSTICE

Severe labour exploitation: workers moving within or into the European Union

States' obligations and victims' rights

FRA EUROPEAN AGENCY FOR FUNDAMENTAL RIGHTS

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"In certain sectors of the economy, the exploitation of workers who move within or into the EU has become business as usual. Workers coming from other Member States or from third countries perform labour in conditions that offend against human dignity. This happens in **agriculture, forestry, fishery, construction, catering, the textile industry,** domestic work and other sectors."



Inclusive societies

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Food aid in Europe at scale 'not seen since the second world war'

Written by Edward McMillan-Scott MEP on 2 April 2014 in News

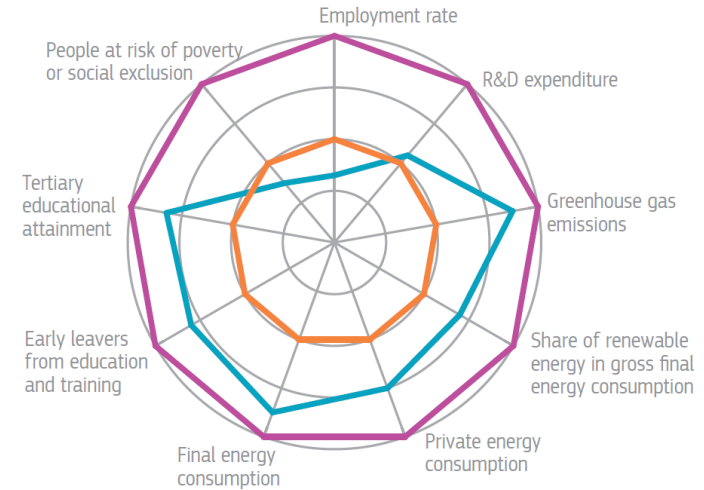
European citizens' growing reliance on food banks is 'unacceptable', and the EU must ensure our populations are able to enjoy a healthy and affordable diet, argues Edward McMillan-Scott.



There is justified concern over the growing reliance on food banks in the UK and across the European Union. We should consider it as a symptom of a broken food system which requires a complete overhaul. We need a sustainable food policy across the EU, where often prosperous farmers will get €350bn over the next seven years, while the most deprived get a meagre €3.5bn.

Source: Eurostat,
<http://ec.europa.eu/eurostat/documents/2995521/6664132/1-02032015-CP-EN.pdf/e339ff6c-ee5c-4385-9cbc-bce32fbd8d7>

■ Europe 2020 targets ■ Most recent data 2012/13 ■ 2008



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INCLUSIVE GROWTH

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Inclusive Growth

There is an urgent call for governments to address inequalities.

In many countries, people have not seen their incomes rise for years. The gap between rich and poor has widened, with those at the top capturing the 'lion's share' of growth. Rising inequality in earnings and in wealth is a major concern, but money is just one aspect of people's well-being. In just about every area, whether it be education, life expectancy, or employment prospects, success is determined by socio-economic status, wealth and assets, sex, age or the places where people live.



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Citizen science

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Citizen Science spans a range of levels of engagement: from being better informed about science, to participating in the scientific process itself by observing, gathering or processing data.



Citizen science is a broad term, covering that part of [Open Science](#) in which citizens can participate in the scientific research process in different possible ways: as observers, as funders, in identifying images or analysing data, or providing data themselves. This allows for the democratisation of science, and is also linked to stakeholders' engagement and public participation.

Depending on their personal interest, time, and technological resources, the citizen decides on how to be involved. Observing sightings of birds, identifying galaxies, or working out how to fold proteins, providing resources by lending computer time or direct financing as in crowd funding of scientific projects.

European actions on Citizen Science

Giving citizens a greater role in science can deliver the vision of "science for the people, by the people" for Europe. Some of the benefits of this approach are:

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'Inclusive Smart Cities: A European Manifesto on Citizen Engagement' Conference

Smart Cities News

- 60 International Mayors Found the Global Parliament of Mayors 21.09.2016 | Comments: 0
- The Spanish National Plan for Smart Cities, a "pioneer governance framework" according to ITU/UNESCO 20.05.2016 | Comments: 0
- Registration Open for the Conference "Inclusive Smart Cities:"

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Stanford SOCIAL INNOVATION REVIEW

Civic Engagement

A New Model for Citizen Engagement

Traditional municipal volunteering programs give people an opportunity to give their time and labor to worthy projects. By transforming those programs into "impact volunteering" efforts—into vehicles for deliberation, collaboration, and connection—leaders and citizens can lay a foundation for civic renewal.

By Myung J. Lee & Peter Levine | Fall 2016



Members of AmeriCorps VISTA join city staff members and local volunteers to revitalize a hospital campus in Detroit. (Photograph by Haley Kallenberg, courtesy of City of Service)

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#OpenScience: Like a #rigordefacto, a "fingert lens" could significantly enhance traditional investment approaches. @jcu_CU ewly7y6Qd9uXk

#Citizenscience: RT @WallaceBSara: Now that @ClintonGlobal is

In 2013, the city of Birmingham, Ala., implemented *Love Your Block*, a nationwide program that awards small grants to local volunteer groups that propose projects that will improve their neighborhoods. Before issuing a request for proposals, the city conducts

07:59 agenda21wal.wordpress.com

Agenda 21 local Commune de Woluwe-St-Lambert

Avec vous, peignons l'avenir de toutes les couleurs! Mise en oeuvre

Notions-clé | Processus | Plan d'action

Vous êtes here: Accueil - Réparer Café : appel aux réparateurs volontaires!

21 janvier 2014 | 1 commentaire

Réparer Café : appel aux réparateurs volontaires!

Que faire d'une chaise au pied branlant ? D'un grille-pain qui ne marche plus ? D'un pull troué aux milles ? Les jeter ? Pas question ! On les remet en état au Réparer Café. Après quelques autres communes bruxelloises, Woluwe-St-Lambert s'est donné à son tour son propre Réparer Café.

Jeter ? Pas question !

Réparer ensemble, c'est l'idée des Réparer Cafés, des rencontres ouvertes à tous dont l'entrée est libre. Des regards et la main se sont mis aux rendez-vous : techniciens, couturiers, menuisiers, informaticiens, ...

RECHERCHE

REPARER Café Woluwe-Saint-Lambert organise des ateliers de réparation pour les habitants de Woluwe-Saint-Lambert. Les ateliers se tiennent tous les mardis, jeudi et samedi après-midi de 14h à 18h dans le local du Réparer Café à Woluwe-Saint-Lambert.

CONTACT

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Sous-Division Développement Durable
Serres communales
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1200 Woluwe-St-Lambert

REMERCIEMENTS

Mme Dubout@woluwe1200.be
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Kitchen Commons

Kitchen Commons fosters a network of community kitchens that bring people together to share food, resources and relationships. We support grassroots leaders and their kitchen partners through training and resources.

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- Resources
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Looking for a kitchen? Many hands make



European Commission

Security "by design"

Address root causes of unrest, conflict, migration

"Nexus thinking is eloquent and compelling on the subjects of efficiency and innovation, but silent on the topics of equity and security. The billion plus people who remained destitute at the end of the twentieth century have now migrated into peri-urban squalor, lost land, assumed debts, remained illiterate, acquired drug-resistant pathogens, grown in numbers, and amassed cheap Cold War weapons and mobile phones.[...].

It would be wise to add equity and security to the nexus."



A CRITICAL VIEW

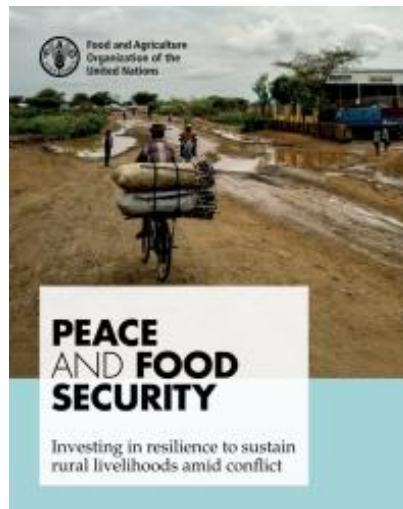
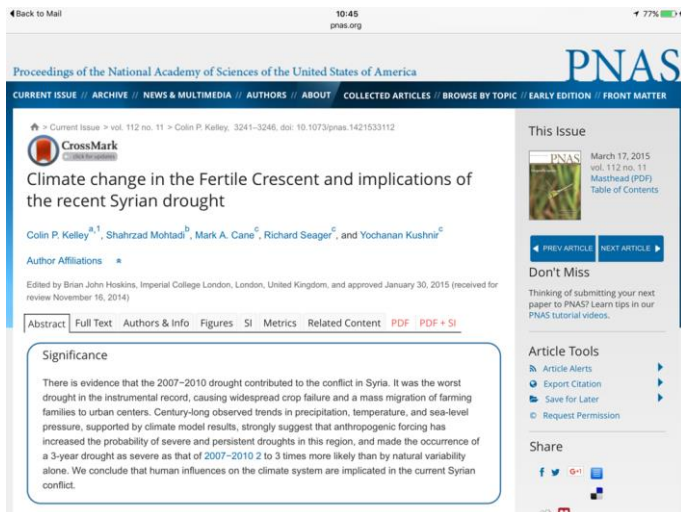
09 May 14

Beyond The "Water-Food-Energy-Climate Nexus"

In order to improve our environmental security, should we think of water, food, energy and climate in nexus-like ways? Richard Matthew is skeptical. While "nexus thinking" promises to reduce waste and inefficiency, it could also heighten inequality, instability and the potential for violent conflict.

In the past five years, a powerful narrative of global environmental rescue has been crafted by leaders from business and government.

http://www.water-energy-food.org/en/news/view_1696/beyond-the-water-food-energy-climate-nexus.html



PEACE AND FOOD SECURITY

Investing in resilience to sustain rural livelihoods amid conflict

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Applying resilience thinking

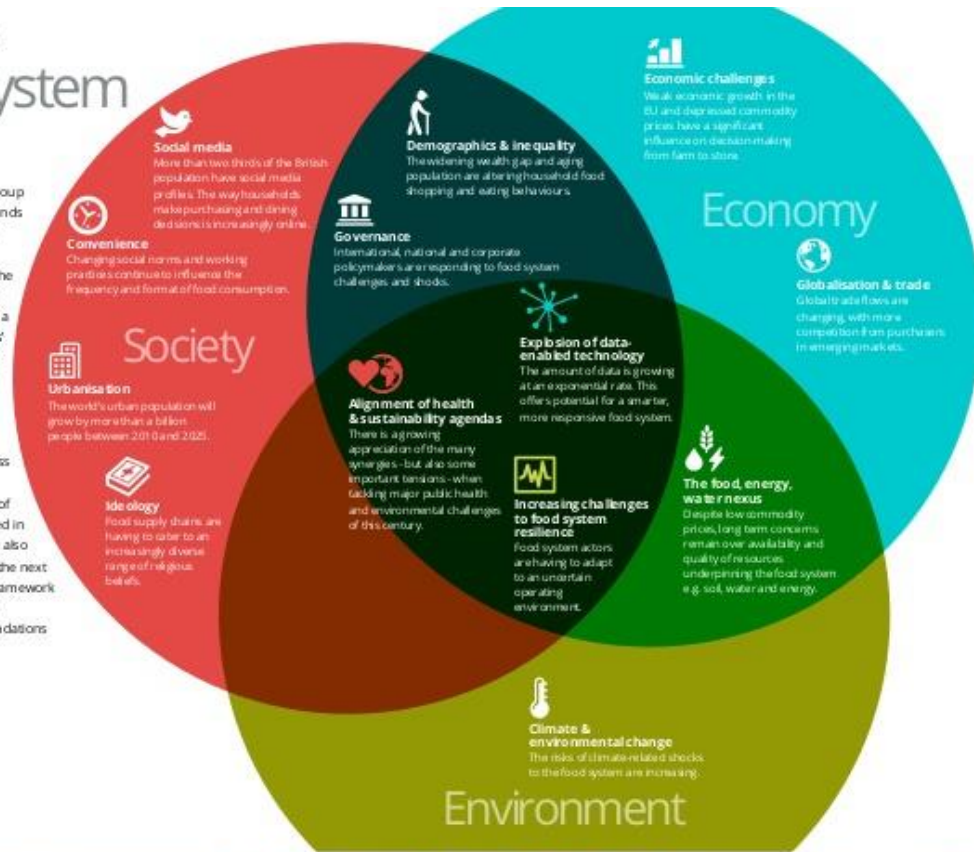
Seven principles for building resilience in social-ecological systems



Introduction Trends

Food system trends

The Thought Leadership Group considered a number of trends that will influence the food system over the coming decade. However, early in the research it was agreed that the project should focus on a small number of 'key trends' that industry, policymakers and WRAP have the power to influence and engage with in the short term. These trends, which touch on a number of issues across the environmental, social and economic dimensions of sustainability, are highlighted in the diagram, right. They are also explored in more detail on the next page and are used as the framework for presenting the research conclusions and recommendations at the end of this report.





IFIB 2016: Sustainability is the single largest business opportunity of this generation

24 September 2016 • Bioeconomista

★★★★★ 4 Votes

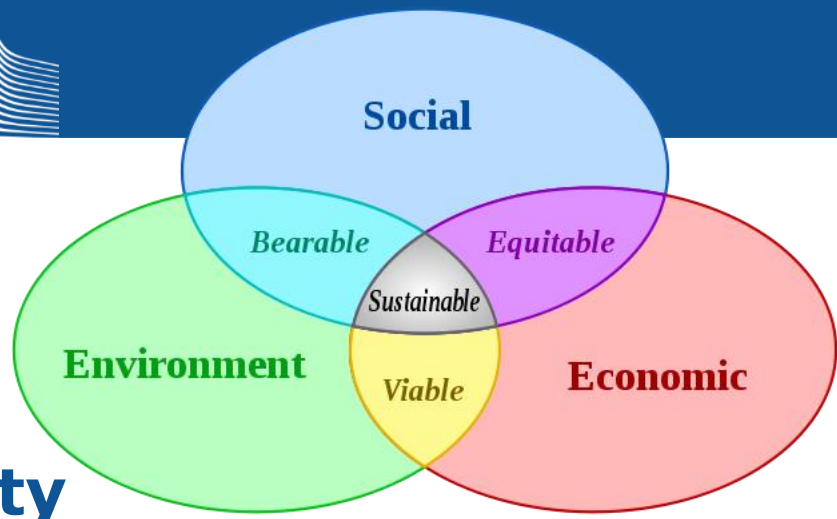


Henri Colens, Braskem Europe

The bioeconomy is alive and is set to grow. This is the strong message coming from Vicenza, Italy, who held the sixth edition of IFIB, the Italian Forum on Industrial Biotechnology and Bioeconomy.

FOOD FOR THOUGHT

Is Sustainability a *sine qua non*?



"In practice, sustainability refers to efforts to align economic development with environmental protection and human well-being. Sustainability is commonly characterized in terms of the interdependence among three broad dimensions—environment, economy, and society—while considering both present and future generations. **The diagram to the right represents these dimensions as nested, with a resilient and robust economy existing within a healthy society dependent on an intact and functional environment.**"

Economy, Society, Environment: A Nested Relationship



<https://cfpub.epa.gov/roe/sustainability.cfm>

FOOD FOR THOUGHT

- *How to achieve sustainable and inclusive biosphere management for prosperity, wellbeing, jobs and growth?*
- *How to make the human-influenced age of the Anthropocene a success?*



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Geology

The Anthropocene epoch: scientists declare dawn of human-influenced age

Experts say human impact on Earth so profound that Holocene must give way to epoch defined by nuclear tests, plastic pollution and domesticated chicken



Nuclear test explosion in Mururoa atoll, French Polynesia, in 1971. The official expert group says the Anthropocene should begin about 1950 and is likely to be defined by the radioactive elements dispersed across Earth by nuclear bomb tests. Photograph: AFP/Getty Images

Damian Carrington
@dpcarrington
Monday 29 August 2016 13:00 BST



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Home Earth Earth Sciences August 29, 2016

The Anthropocene is here: scientists

August 29, 2016



A composite image of the Western hemisphere of the Earth. Credit: NASA

The human impact on Earth's chemistry and climate has cut short the 11,700-year-old geological epoch known as the Holocene and ushered in a new one, scientists said Monday.



The Anthropocene, or "new age of man," would start from the mid-20th century if their recommendation—submitted Monday to the International Geological Congress in Cape Town, South Africa—is adopted.

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Science

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REVIEW

The Anthropocene is functionally and stratigraphically distinct from the Holocene

Colin N. Waters^{1,*}, Jan Zalasiewicz², Colin Summerhayes³, Anthony D. Barnosky⁴, Clément Poirier⁵, Agnieszka Gałuszka⁶, Alejandro Cearreta⁷, Matt Edgeworth⁸, Erle C. Ellis⁹, Michael Ellis¹, Catherine Jeandel¹⁰, Reinhold Leinfelder¹¹, J. R. McNeill¹², Daniel deB. Richter¹³, Will Steffen¹⁴, James Syvitski¹⁵, Davor Vidas¹⁶, Michael Wagreich¹⁷, Mark Williams², An Zhisheng¹⁸, Jacques Grinevald¹⁹, Eric Odada²⁰, Naomi Oreskes²¹, Alexander P. Wolfe²²

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Science 08 Jan 2016:
Vol. 351, Issue 6269.
DOI: 10.1126/science.1246222

Feature

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FOOD 2030: Research & Innovation for Tomorrow's Nutrition & Food Systems

