

Welcome to this week's presentation and conversation
hosted by the
Canadian Association for the Club of Rome,
a Club dedicated to intelligent debate and action on global issues.

Circular Economy seems so obvious – why is it so slow in the making?”

Our speaker today is Dr. Anders Wijkman, an opinionmaker & author, but so much more: past Member of the European Parliament; executive with the UN; Secretary General of the Swedish Red Cross; Director General of the Swedish Agency for Research Cooperation with Developing Countries; member of the Swedish Royal Academy of Sciences, the World Academy of Art & Science, & the World Future Council; honorary doctor at Linköping U; honorary president of the Club of Rome; member of the International Resource Panel (a UN body on improving the use of resources worldwide); chair of Circular Sweden (a platform for producers, retailers, & recycling firms to advance the Circular Economy). Today he will describe the many benefits of going circular: reduced pollution, lower carbon emissions, less pressure on biodiversity & fragile ecosystems, cost savings, & employment gains. He'll then address barriers to change and suggest policy measures to overcome the barriers.

Dr. Wijkman's presentation will be followed by a conversation, questions, and observations from the participants.

CACOR acknowledges that we all benefit from sharing the traditional territories of local Indigenous peoples (First Nations, Métis, and Inuit in Canada) and their descendants.



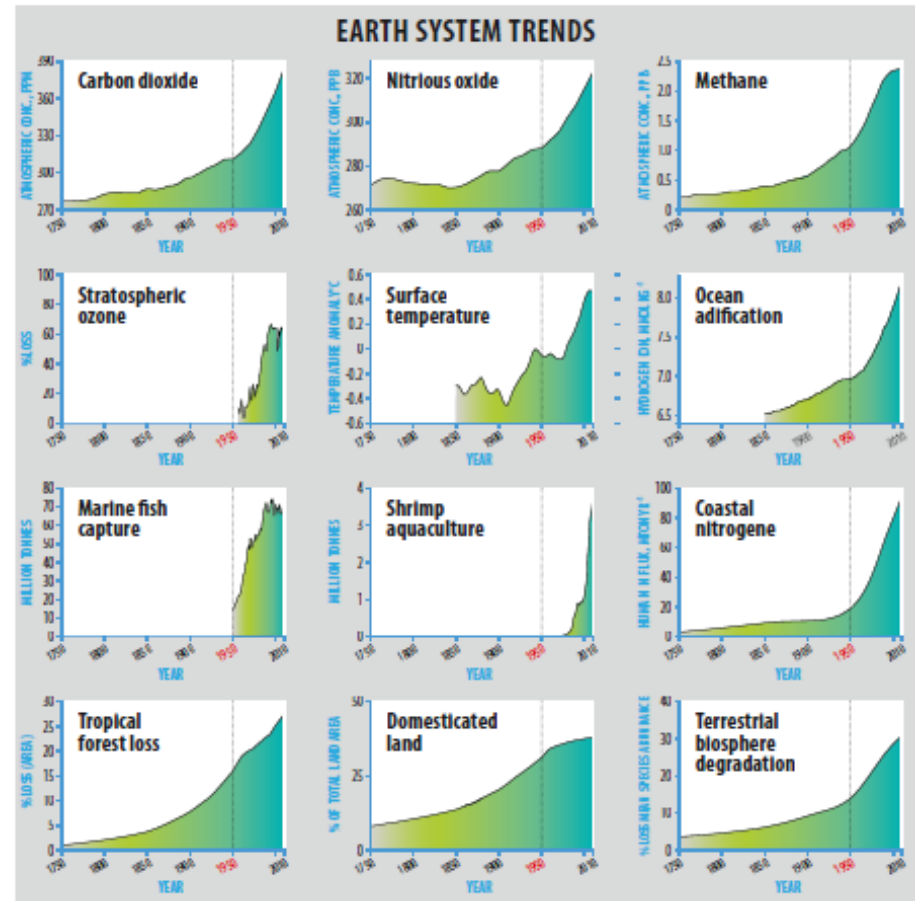
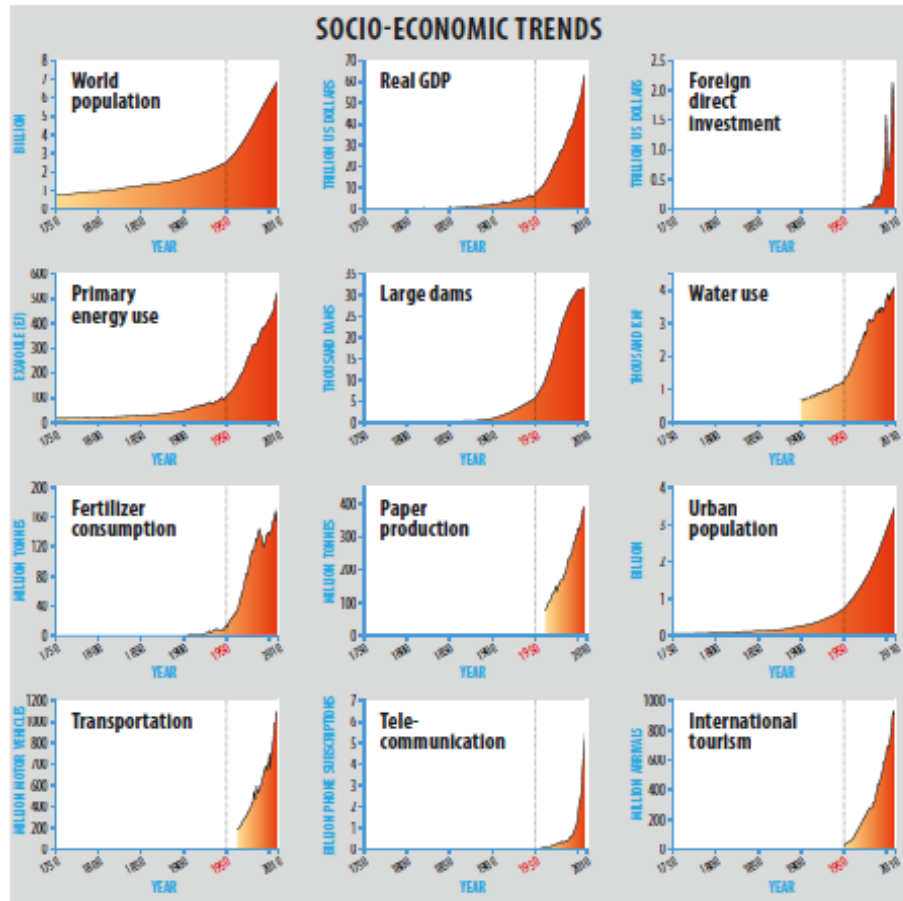
2022 April 27

“Circular Economy seems so obvious – why is it so slow in the making?”

- Presentation by Anders Wijkman, Honorary President Club of Rome, Chair Climate-KIC at CACOR Webinar April 27, 2022

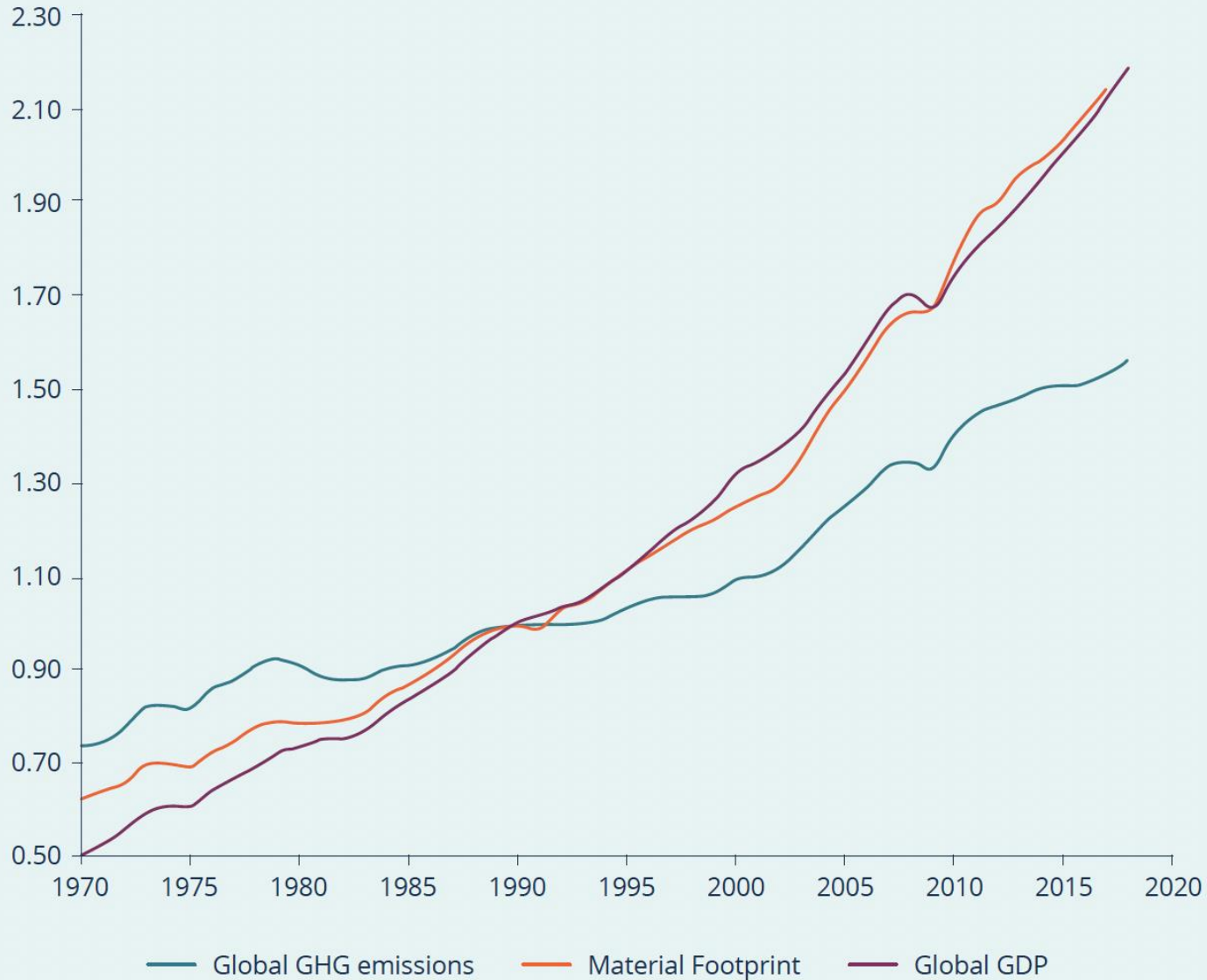
The Anthropocene: steep upwards curves since 1950

of **human consumption** and of **human induced pollution**.

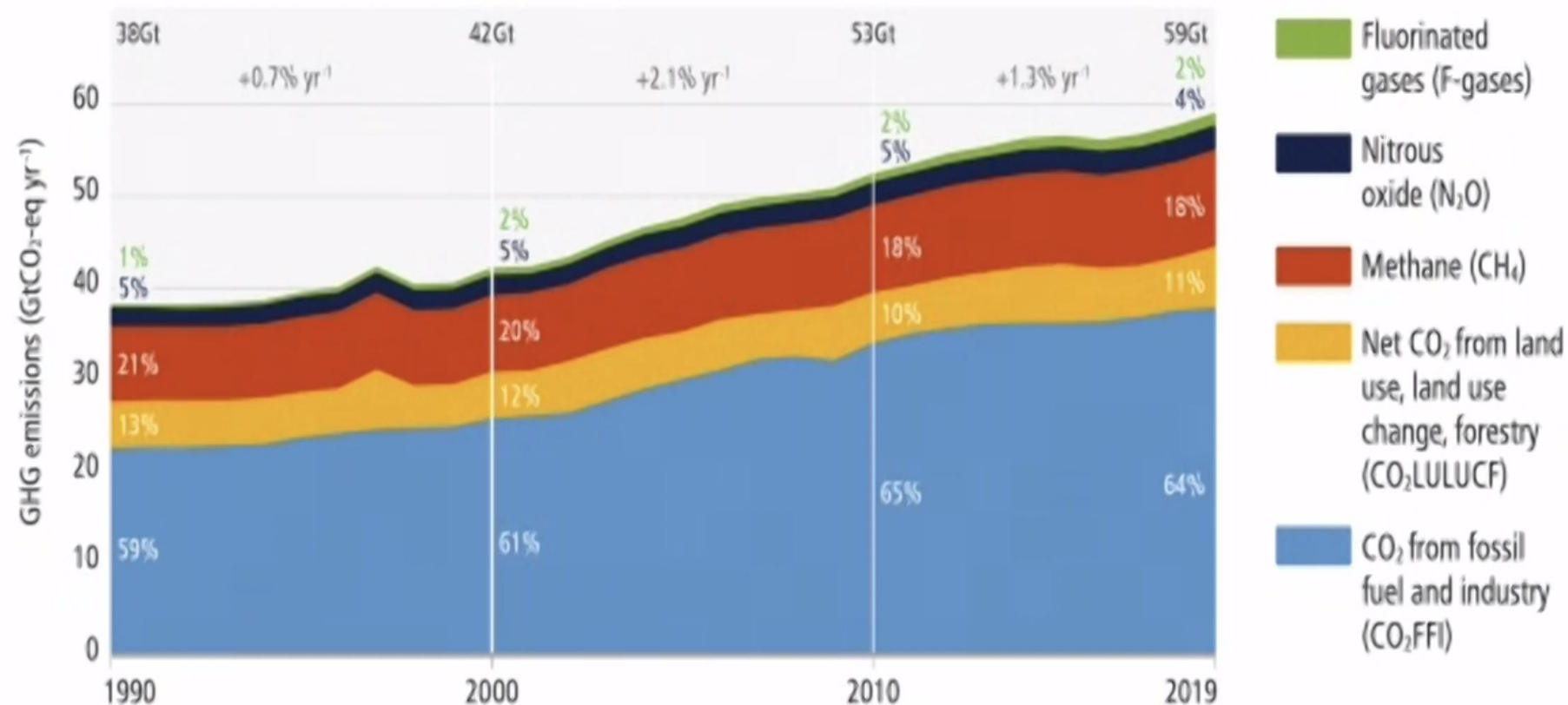


adapted from Steffen, Crutzen et al 2007

Relative change in main global economic and environmental indicators from 1970 to 2018



We are not on track to limit warming to 1.5 °C.



24th Jul
2019

Amazon deforestation is accelerating towards an unrecoverable tipping point, Brazilian scientists say



Government data show a surge to three football pitches a minute in the 7 months since hard-right populist president Bolsonaro came to power.

Plummeting insect numbers 'threaten collapse of nature'

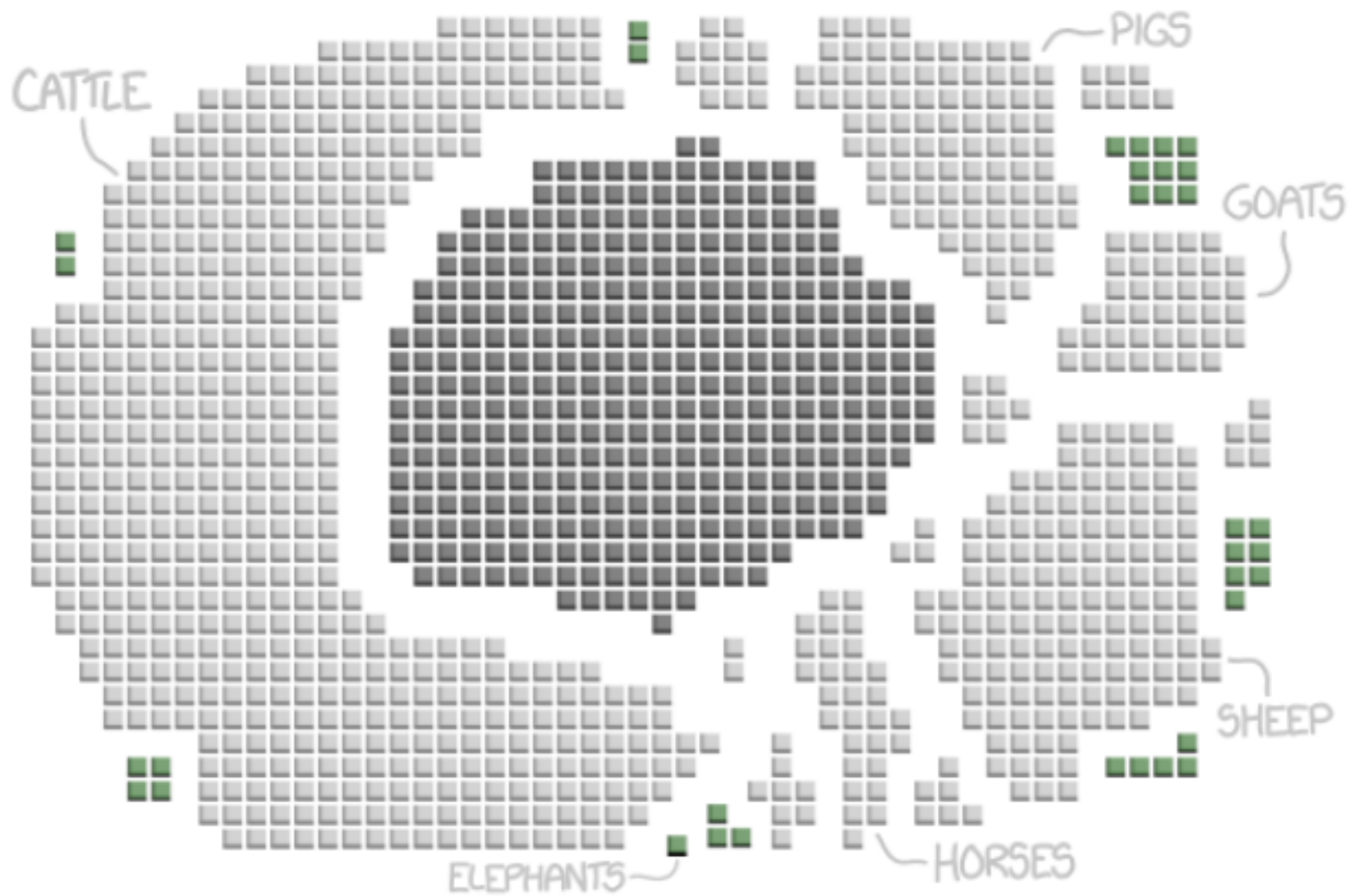


▲ The rate of insect extinction is eight times faster than that of mammals, birds and reptiles. Photograph: Courtesy of Entomologischer Verein Krefeld

EARTH'S LAND MAMMALS BY WEIGHT

■ = 1,000,000 TONS

■ HUMANS ■ OUR PETS AND LIVESTOCK ■ WILD ANIMALS



DATA FROM VACLAV SMIL'S *THE EARTH'S BIOSPHERE: EVOLUTION, DYNAMICS, AND CHANGE*, PLUS A FEW OTHER SOURCES.

IPBS-rapporten

Bob Watson, ordförande i IPBS:

- ”For a long time, people just thought of biodiversity as saving nature for its own sake,
- But this report makes clear the links between biodiversity and nature and things like food security and clean water in both rich and poor countries.”





Arctic ice is getting thinner as the planet warms.

2022-04-27
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2022-04-27

Place where you are
Place where you are
Place where you are

11
11
11

Speed at which world's glaciers are melting has doubled in 20 years

Glacier melt contributing more to sea-level rise than loss of Greenland and Antarctic ice sheets, say experts



▲ Portage glacier in Chugach National Forest in Alaska. The US state accounted for 25% of global glacier loss
Photograph: Yereth Rosen/Reuters

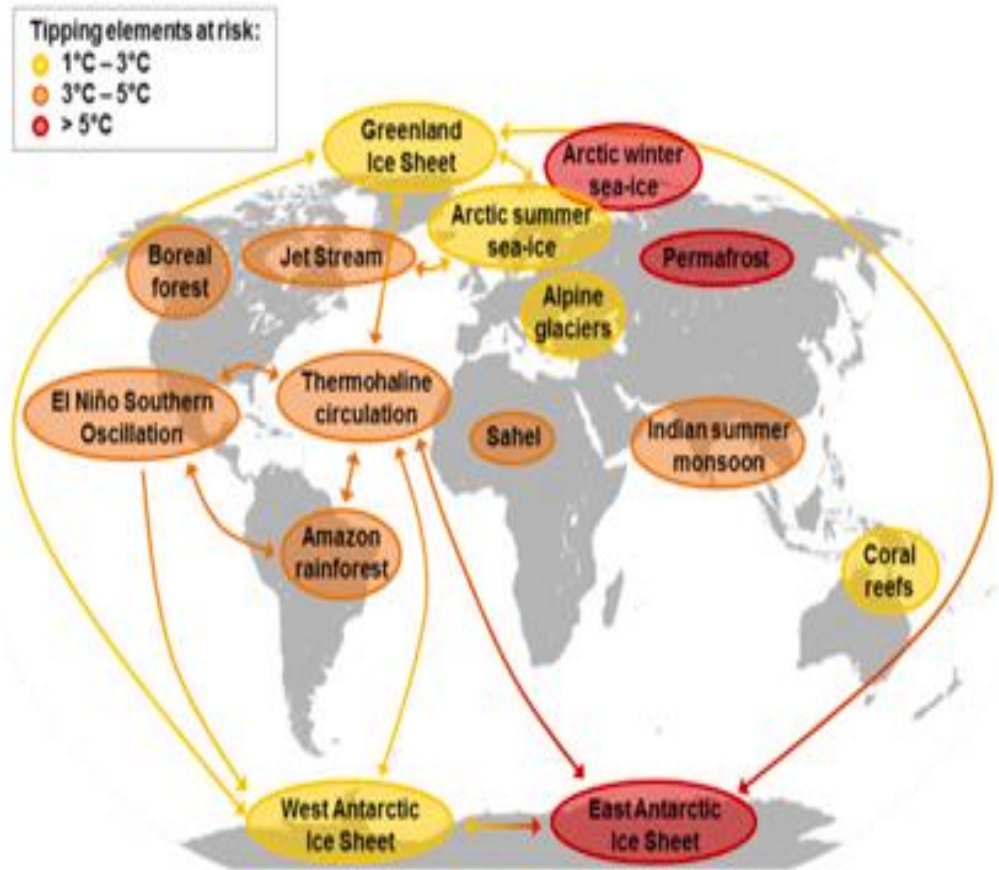
Tipping Points



are Real



The Global Risk of a Hothouse Earth Trajectory



Trajectories of the Earth System in the Anthropocene

Will Steffen^{a,b,1}, Johan Rockström^a, Katherine Richardson^a, Timothy M. Lenton^a, Carl Folke^{a,c}, Diana Liverman^a, Colin P. Summerhayes^a, Anthony D. Barnosky^b, Sarah E. Cornell^a, Michel Crucifix^d, Jonathan F. Donges^{a,k}, Ingo Fetzer^a, Steven J. Lade^{a,b}, Marten Scheffer^a, Ricarda Winkelmann^{a,m}, and Hans Joachim Schellnhuber^{a,k,m,1}

Edited by William C. Clark, Harvard University, Cambridge, MA, and approved July 6, 2018 (received for review June 19, 2018)

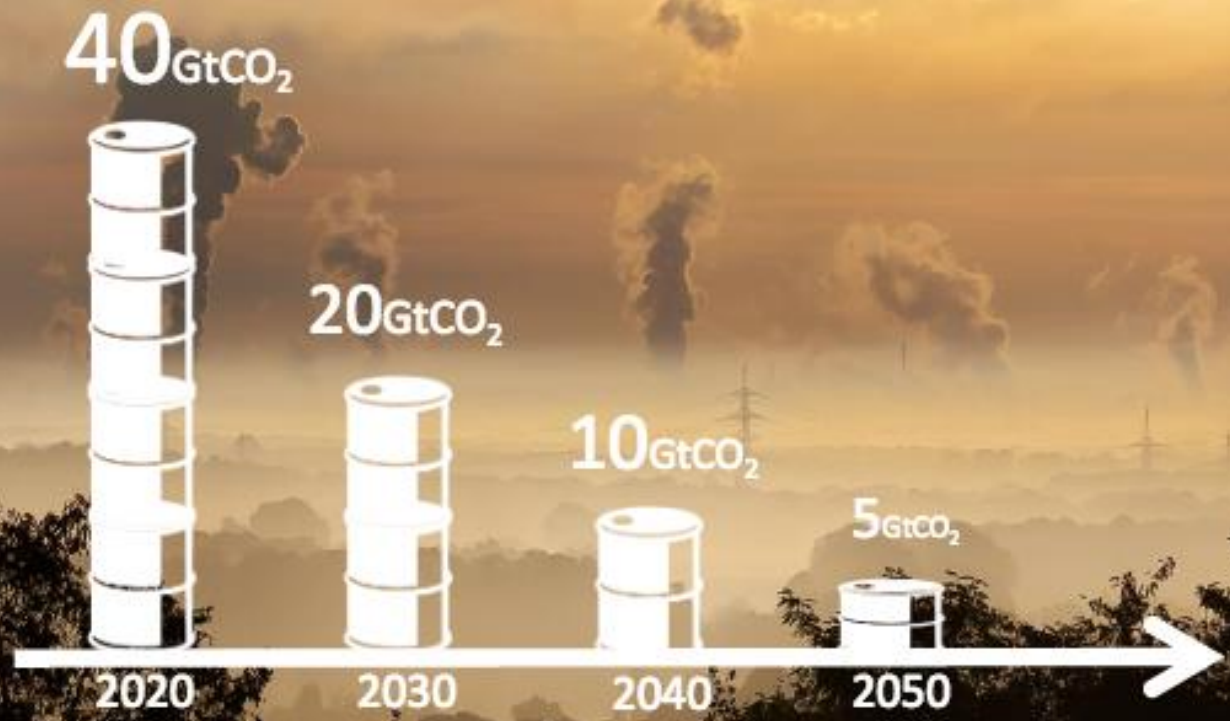
Table 1. Carbon cycle feedbacks in the Earth System that could accelerate global warming

Feedback	Strength of feedback by 2100, °C	Refs. (SI Appendix, Table S2 has more detail)
Permafrost thawing	0.09 (0.04–0.16)	20–23
Relative weakening of land and ocean physiological C sinks	0.25 (0.13–0.37)	24
Increased bacterial respiration in the ocean	0.02	25, 26
Amazon forest dieback	0.05 (0.03–0.11)	27
Boreal forest dieback	0.06 (0.02–0.10)	28
Total	0.47 (0.24–0.66)	

^aThe strength of the feedback is estimated at 2100 for an -2 °C warming.
^bThe additional temperature rise (degrees Celsius) by 2100 arising from the feedback.

A Global Carbon Law

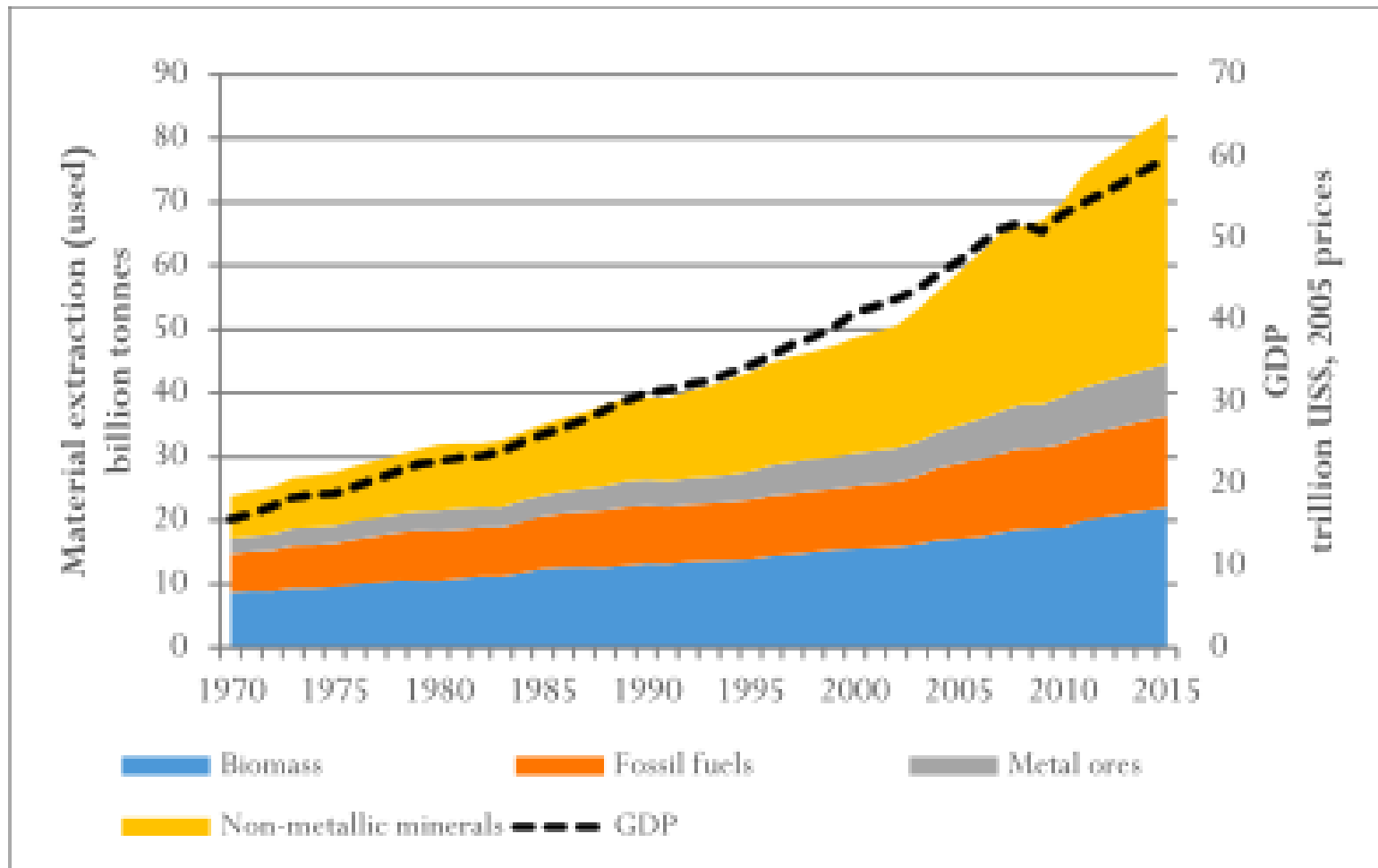
Halving Emissions Every Decade



Huge difference between incrementalism and transformation

- Reducing GHG by 20-30% easy
- Transformation is different
- All major sectors: energy, infrastructure, basic mtrls, agriculture, forestry, textiles, electronics etc
- *So far most of the focus on Energy use, but*
- *Material use is crucially important*

Figure 3: Global material extraction in billion tons, and global GDP in trillion US dollars 2005 prices, 1970-2015.



Source: Material extraction data from UNEP (2016a), GDP data from UNSD (2015).

International Resource Panel

- 50% of global carbon emissions and 90% of biodiversity loss related to the extraction and processing of materials, fossil fuels and food
- The production of cement, steel, aluminum and plastics make up almost 20% of global carbon emissions - (GRO 2019)

Natural Resources:

Provide the foundation for the goods, services and infrastructure that make up our current socio-economic systems



Biomass

Biomass (wood, crops, including food, fuel, feedstock and plant-based materials)



Fossil fuels

Fossil fuels (coal, gas and oil)



Metals

Metals (such as iron, aluminum and cooper...)



Non-metallic minerals

Non-metallic minerals (including sand, gravel and limestone)

Materials
Extracted from earth

Focus on natural resource management still lacking

The *use of natural resources* sits at the very heart of the challenges – The way we (mis)manage them is the *common cause* of climate change, biodiversity loss and pollution/health impacts.

Understanding that, provides us with a *clear message of hope* that by *identifying the root causes* of these crises, we can deliver policy responses that can *tackle them effectively together*.

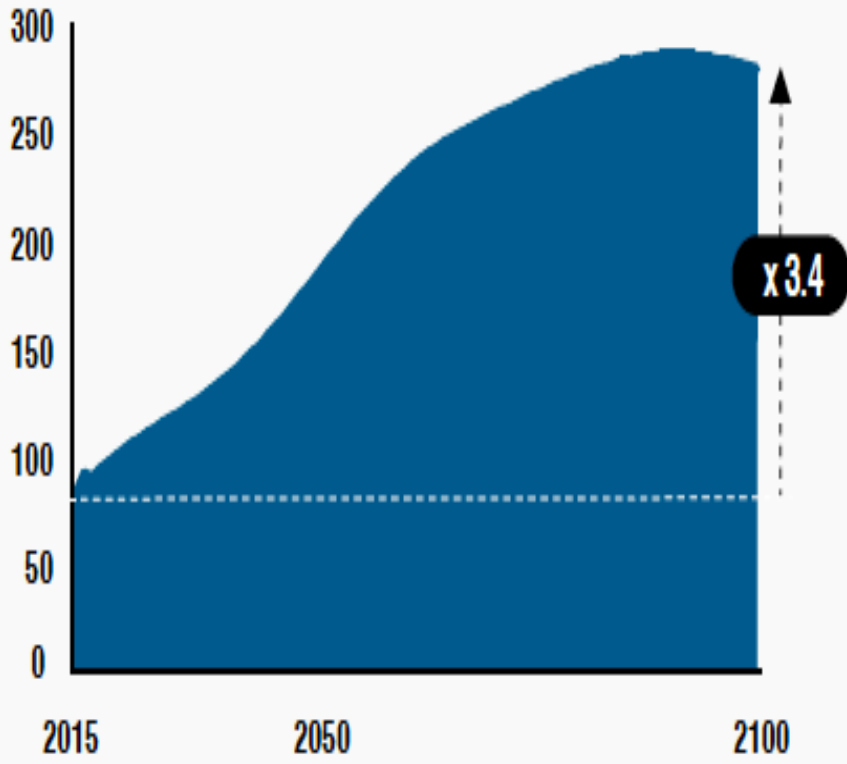


International
Resource
Panel

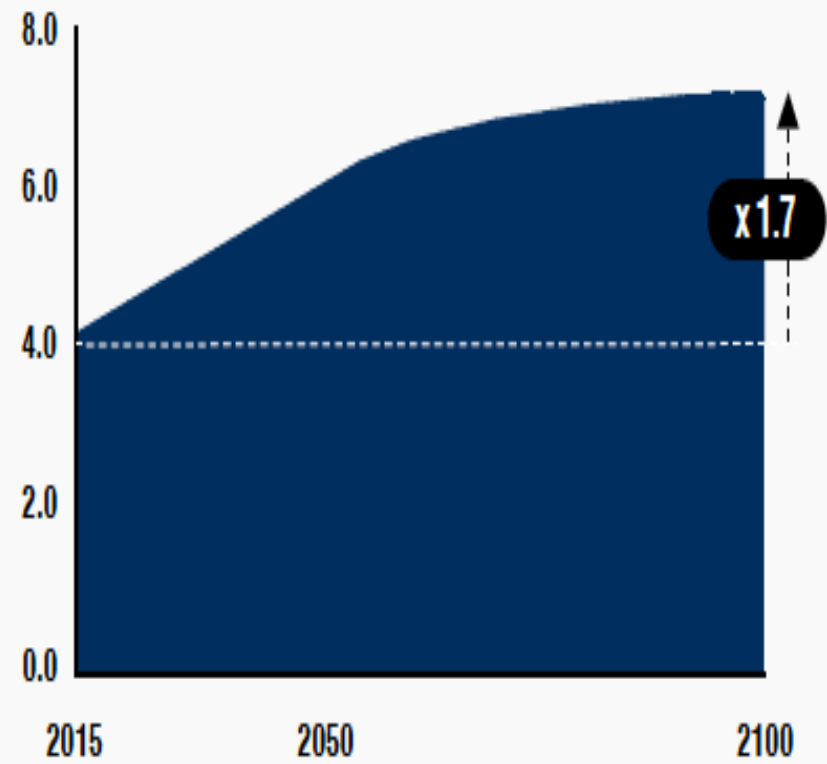
THE TASTE OF 21ST CENTURY URBANISATION

- *More than 50% of urban fabric* expected to exist by 2050 still needs to be constructed
- In the three years period (2011-2013), *China* has used more *cement* than the *USA* during the entire 20th century

ALUMINIUM
Mt ALUMINIUM PER YEAR

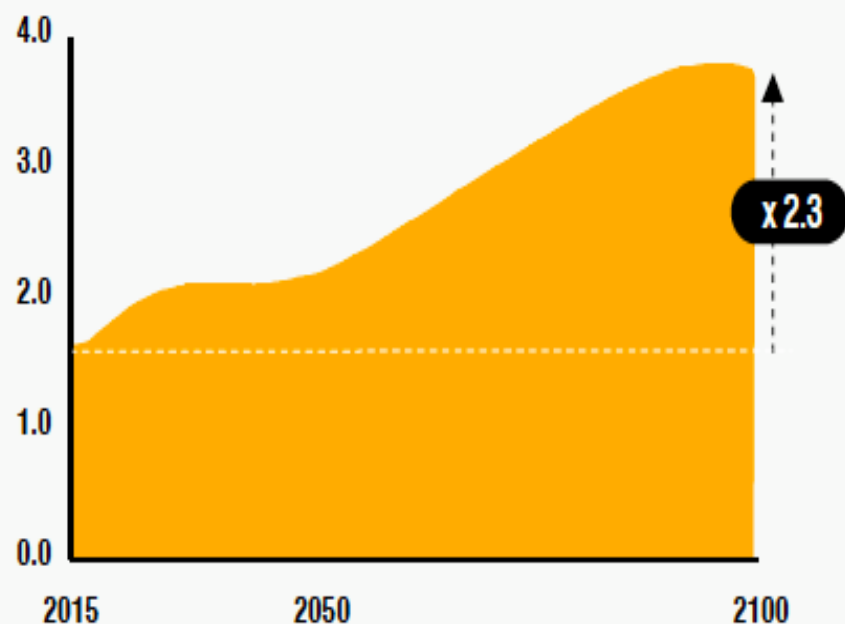


CEMENT
Gt CEMENT PER YEAR

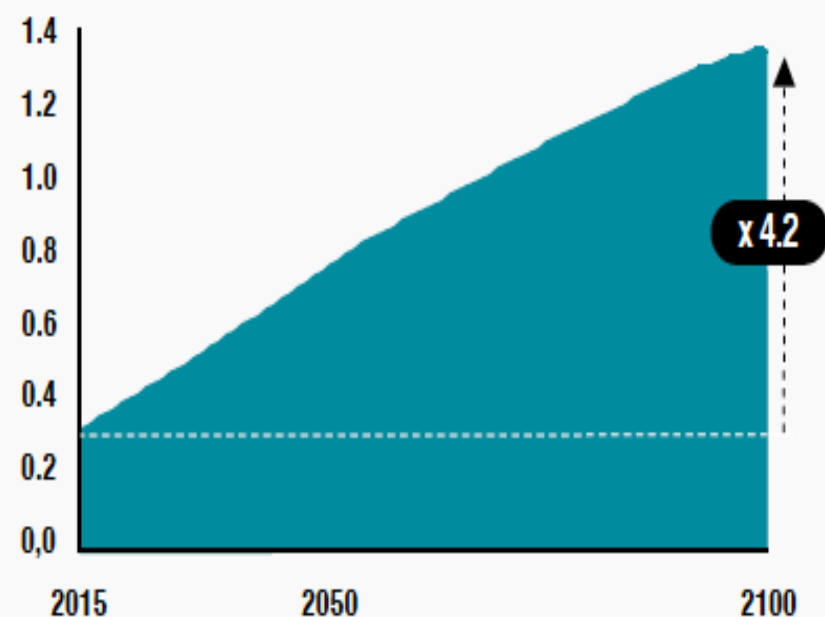


WITH CURRENT PATTERNS OF MATERIALS USE, GLOBAL DEMAND FOR KEY MATERIALS WILL INCREASE 2- TO 4-FOLD

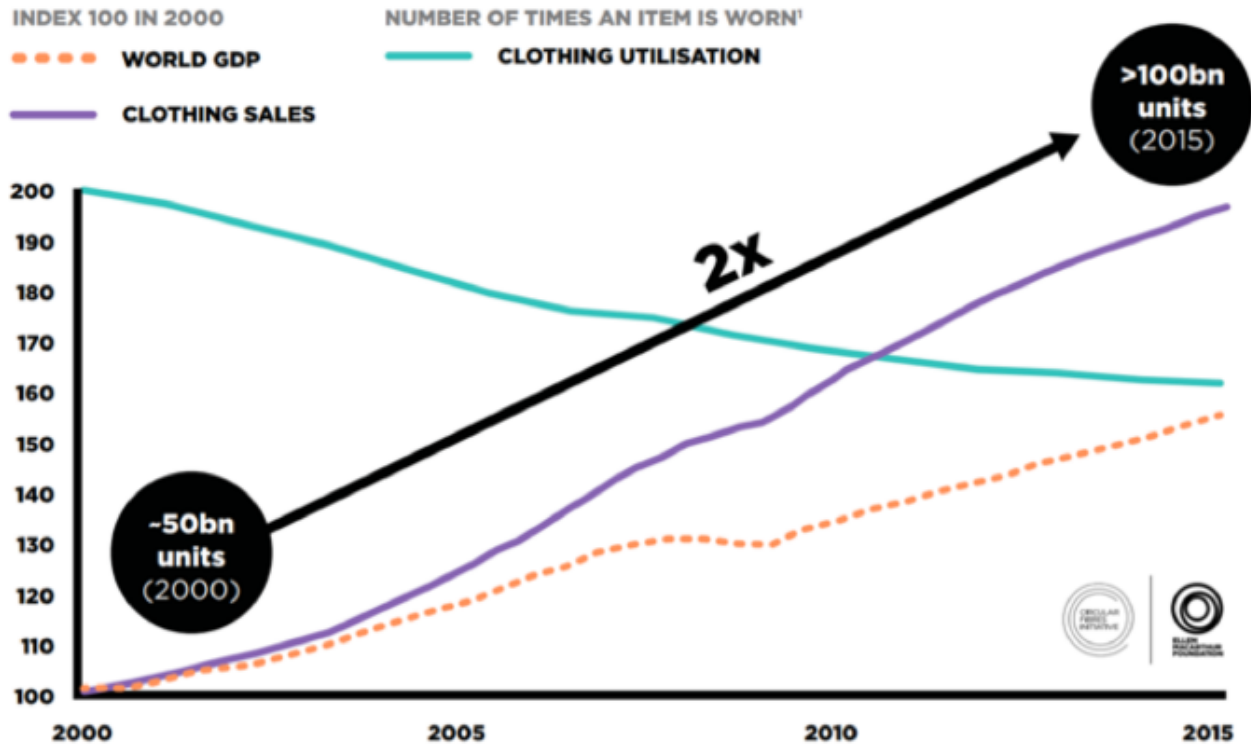
STEEL
Gt STEEL PER YEAR



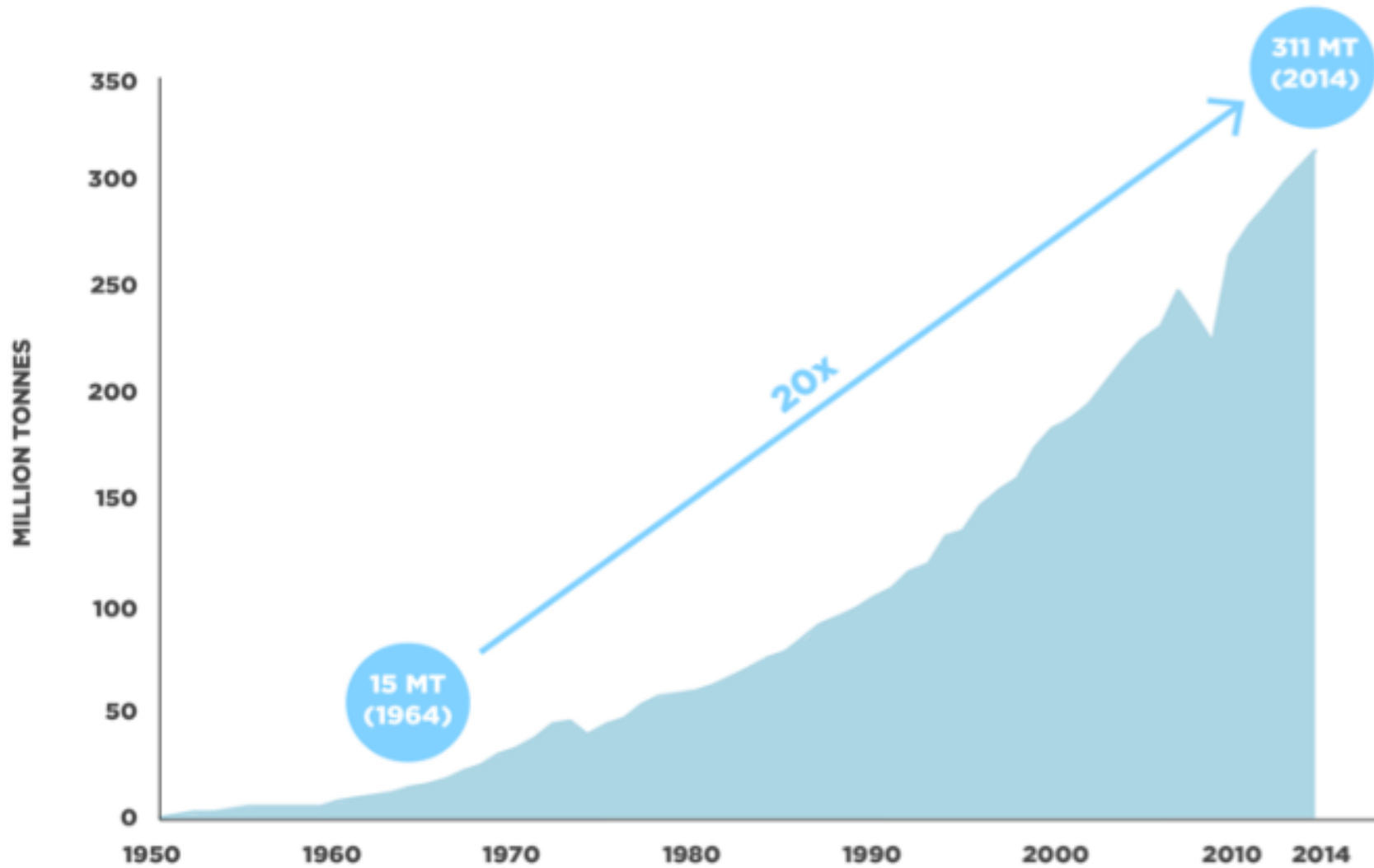
PLASTICS
Gt PLASTICS PER YEAR




We have doubled our clothes consumption since 2000...



Plastics touch everyone - exponential



The Challenges...

A wide-angle photograph of a massive landfill filled with plastic waste, including numerous plastic chairs and other debris. The scene is set against a dramatic sunset sky with orange and yellow clouds. The text "On average, Europe uses materials only once." is overlaid at the bottom of the image.

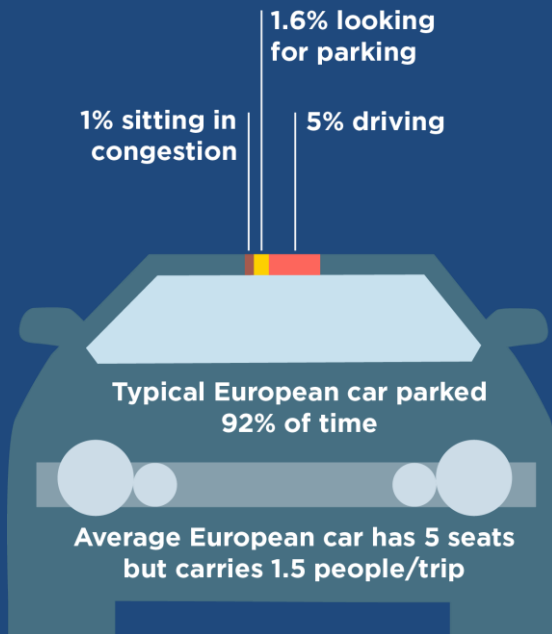
On average, Europe uses materials **only once.**

Today's production system is utterly wasteful

- Even with high recycling, materials are poorly utilised
- Only 25% of material value captured after first use cycle; plastics only 8%
- Ex plastics, electronics, household appliances, building materials, textiles etc
- Huge values thrown away
- Serious pollution + CO₂+ biodiversity loss
- Infrastructure and products poorly utilised

Examples of structural waste in our economy

Mobility

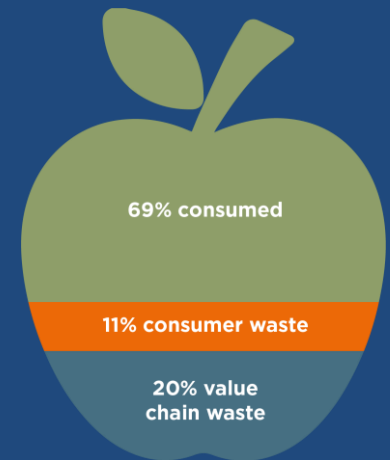


Built environment



10-15% of building material wasted
Demolition materials unsuitable for reuse;
54% landfilled

Food



Hugely dependent on fossil input factors

Material Footprint

tonnes per capita

● 1970
● 2017

2.5 | 2



Low
Income

3 | 5



Lower-Middle
Income

8 | 17



Upper-Middle
Income

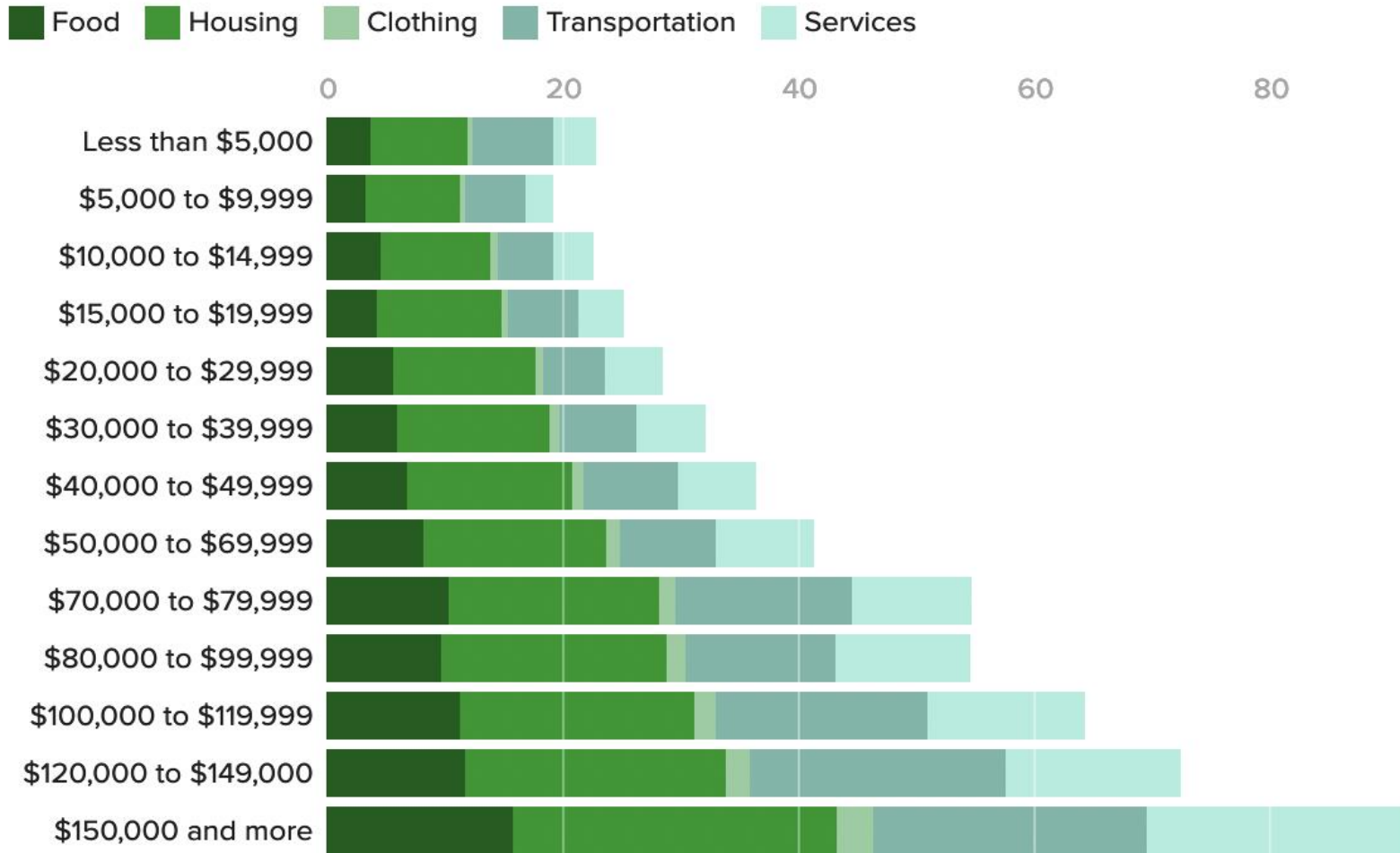
20 | 27



High Income

More money, more carbon

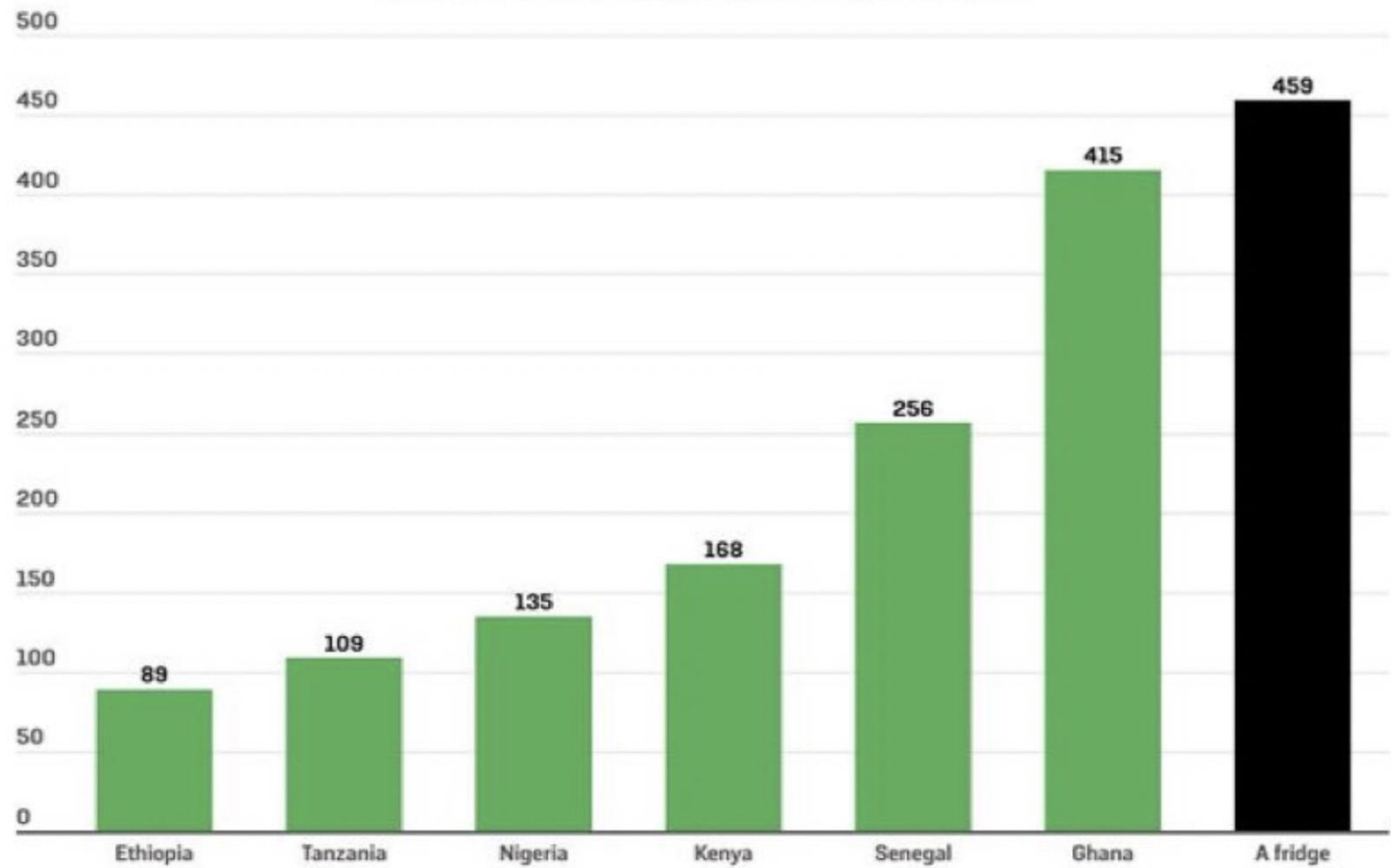
U.S. household emissions, by household income. (Expressed in terms of tons of carbon dioxide per year.)



Source: Environment International

African Energy Use Per Person Vs. a Typical American Refrigerator

Annual kilowatt-hours of electricity consumed per capita, 2017

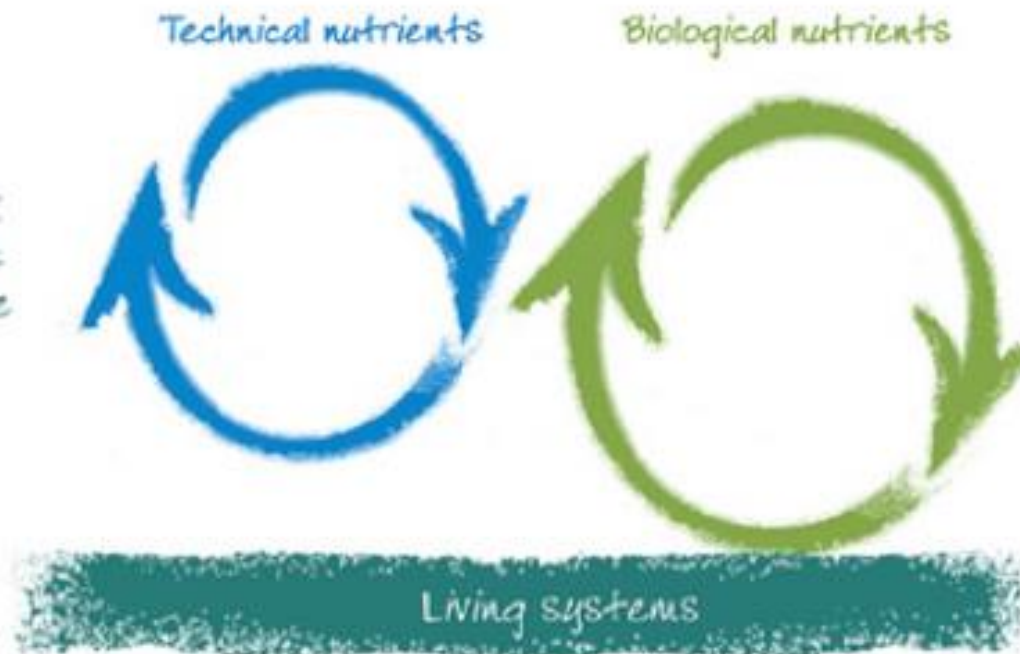


SOURCE: INTERNATIONAL ENERGY AGENCY AND ENERGY FOR GROWTH HUB

'Linear economy'



'Circular economy'



after W. McDonough and M. Braungart

Circular economy

a **metaphor** for renewables, resource efficiency + closing the loops

- Extend Product life; less obsolescence
- Recycle, Reuse, Remanufacture, Repair, Maintenance
- Nutrient recycling
- From selling "stuff" to offering services
- Utilize better what is already produced
- Sharing economy

Note: Nothing is 100% circular and there are rebound effects.....

Regenerative agriculture in Europe

A critical analysis of contributions to European Union
Farm to Fork and Biodiversity Strategies



EASAC policy report 44

April 2022

ISBN: 978-3-8047-4372-4

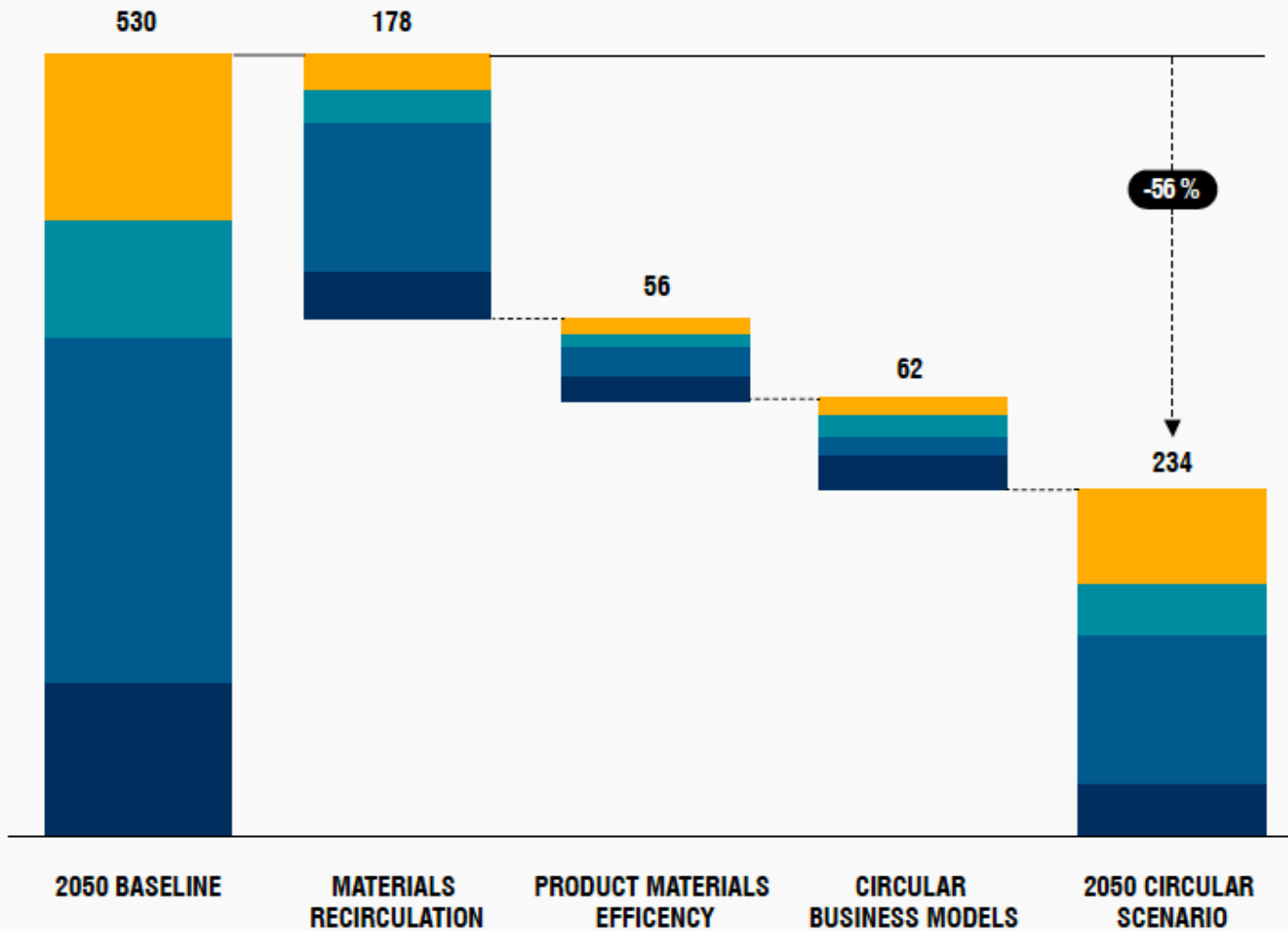
Sweden

	<u>Renewable Case</u>	Energy-efficiency	Material-efficiency	All Three Combined
<u>Emission eduction?</u>	- 50,1 %	- 28 %	- 5 %	- 66 %
Additional Jobs?	Up to 15,000*	+ 20,000	+ >> 50,000	+ > 100,000
Trade Balance Effects	+ 0,4 of GDP	No change	+ > 1 % of GDP	+ > 1,5 % of GDP

EU EMISSIONS REDUCTIONS POTENTIAL FROM A MORE CIRCULAR ECONOMY, 2050

MILLION TONNES OF CARBON DIOXIDE PER YEAR

STEEL PLASTICS ALUMINIUM CEMENT



Circular Economy so obvious – and yet slow in the making.....

- Resources were cheap and abundant
- We did not pay for externalities
- Productivity focus on labor, not materials
- We tax labor, not nature
- Business models favour high throughput and products that do not last long....
- Product Design not aimed at reuse
- Secondary materials markets work poorly
- Too much focus so far on waste m-ment

EU Circular Economy Action Plan

- A sustainable product policy framework
- Expand use of Ecodesign Directive
- Circular Electronics Initiative, incl hazardous substances
- New regulation for batteries
- Reviews of directives on packaging, plastics, micro-plastics, end-of-life vehicles, textiles
- Strategy for Sustainable Built Environment

Societal Needs and Wants

- Housing and Infrastructure
- Nutrition
- Mobility
- Consumables
- Services (health, education, banking etc)
- Communication

Policies for Circularity:

- Tax shift , incl removing VAT on reused materials.
- Design Products/Materials for reuse
- Certain ratio of reused materials in new products
- Material efficiency prio in climate policy
- New business models – “Products as a Service”
- Provide for human needs in smarter ways
- Public procurement must lead the way
- Address the rebound effect

From the resource management point of view the 21st Century will be market by



DECARBONISATION

DEMATERIALISATION





For the Love of Earth

“The major problems of the world are the result of the difference between how nature works and the way people think.”

Greg Bateson

04-27

Plato's Republic

4343