Climate change and need for action

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@WMO

Greener Finance for **Sustainable Future**

EU2019.FI

Where are we with climate change?

Prof. Petteri Taalas
Secretary-General

WEATHER CLIMATE WATER
TEMPS CLIMAT EAU

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World Meteorological Organization
Organisation météorologique mondiale

World Meteorological Organization

- UN Specialized Agency on **weather, climate & water** with 193 Members
- 2nd oldest UN Agency, 1873- with **science and technology** based action
- Coordinates work of > 200 000 national experts from meteorological & hydrological services, academia & private sector
- Co-Founder and host agency of IPCC, WMO SG UN Climate Principal (1/3)

- Global real-time standardized weather & climate observing system backbone of weather & climate services
- 13 WMO global centres, which provide global short and long term forecasts
- Sharing of know-how, developed => developing countries & regional co-operation

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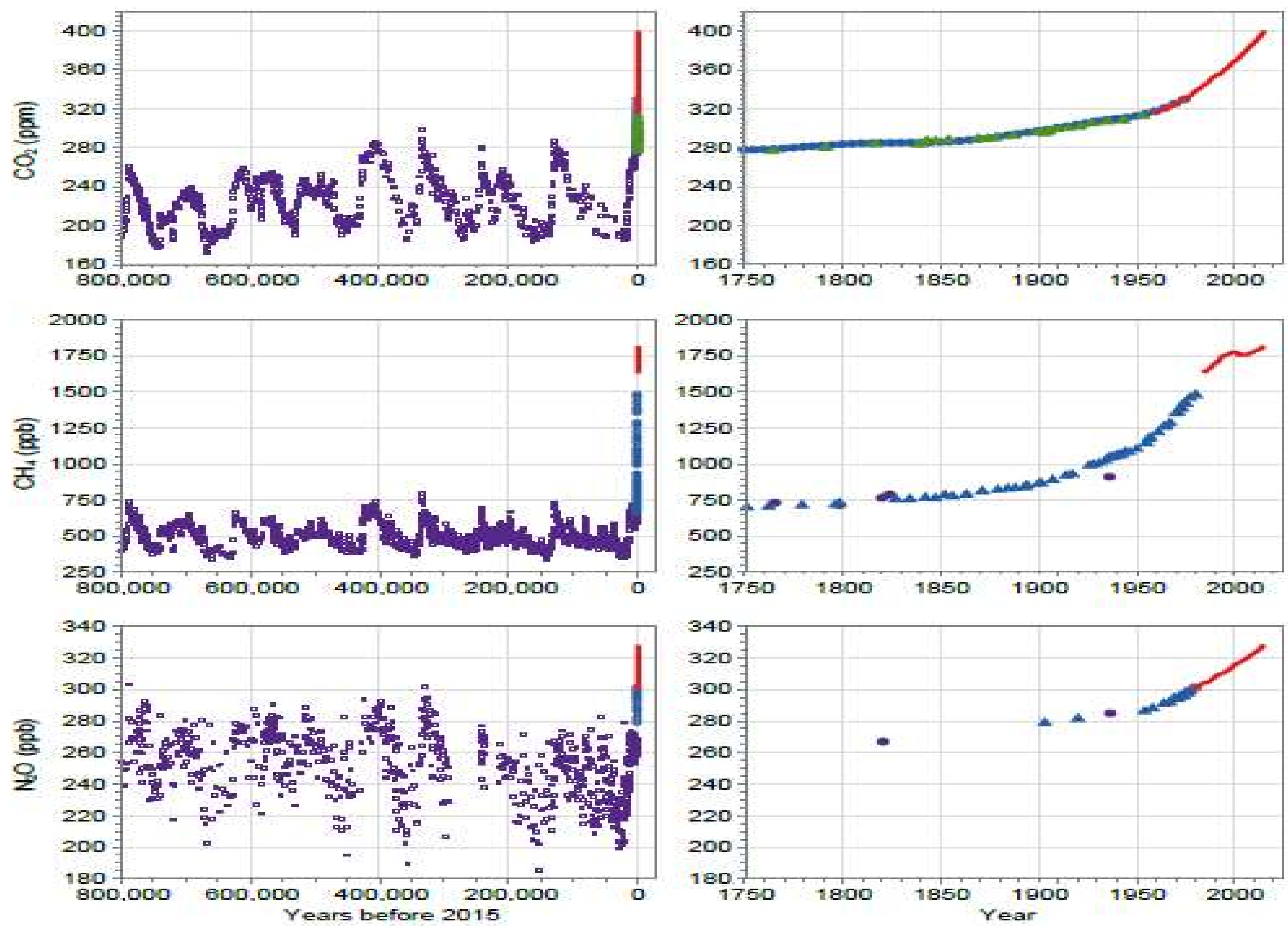
CO_2, CH_4 & N_2O 800 000 BC-2016 AD



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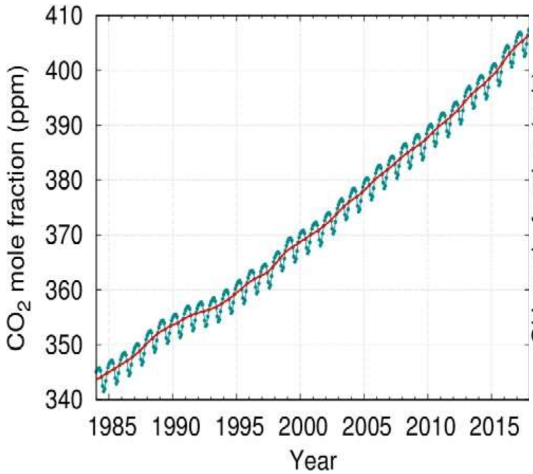
Carbon dioxide level highest in 3 million years

CO_2

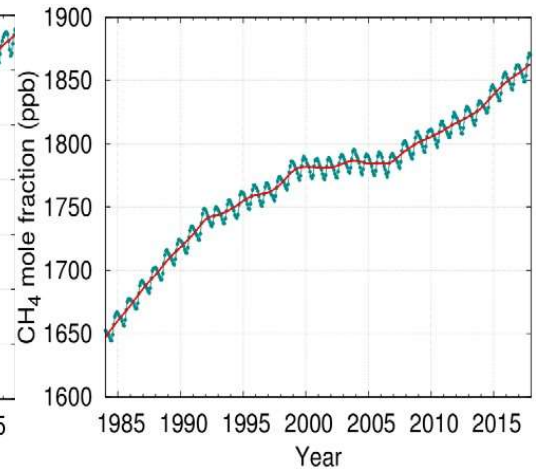


Increase 146 %
(since 18th century)

Lifetime several hundreds years

Contribution to warming 66 %

CH_4

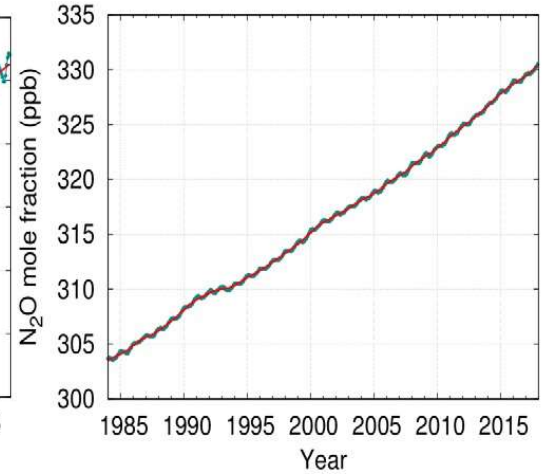


Increase 257 %

Lifetime 12 years

Contribution to warming 17 %

N_2O



Increase 122%

Lifetime 114 years

Contribution to warming 6 %

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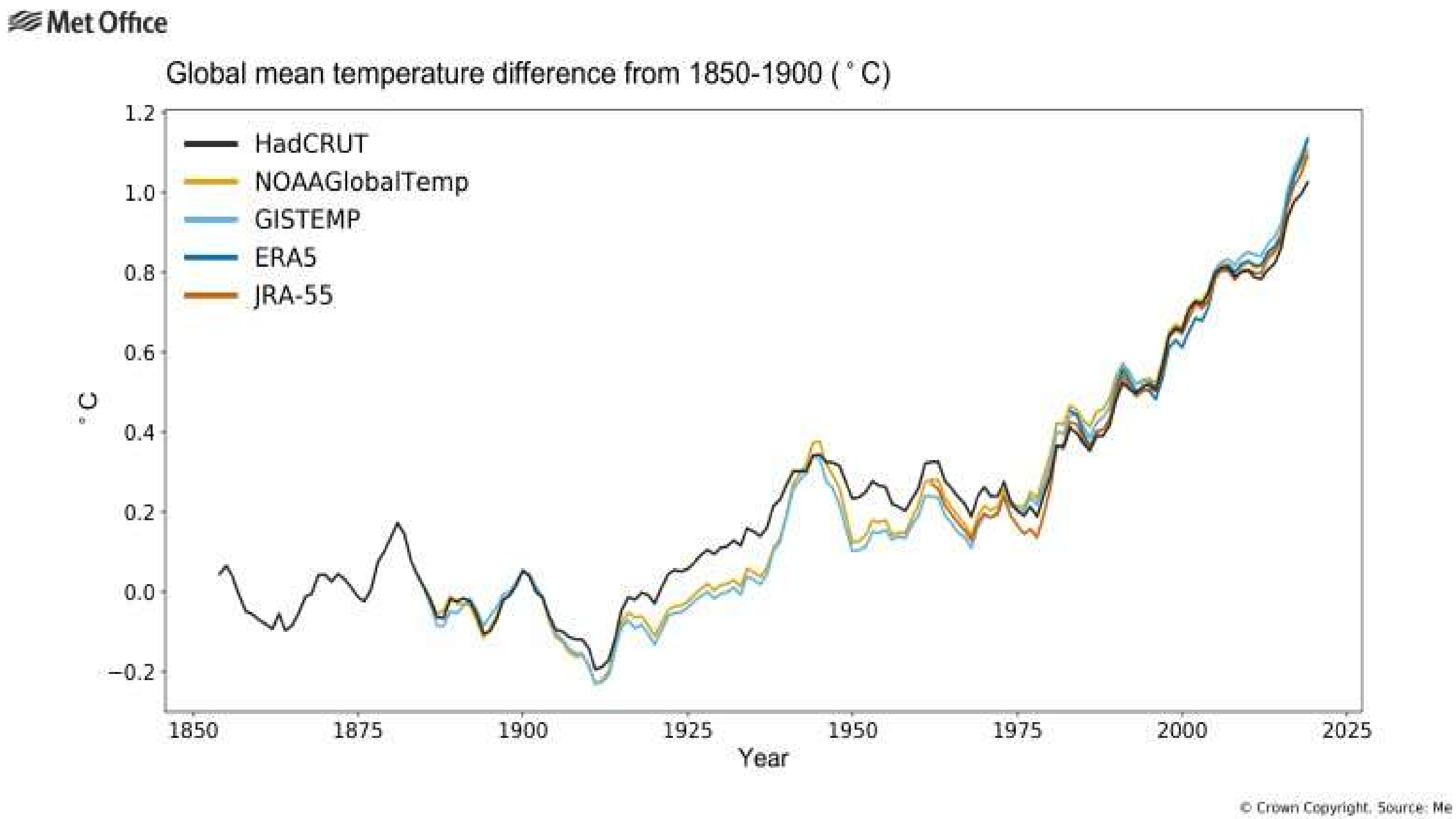
Global temperature 1850-2019, +1.1 ◦C



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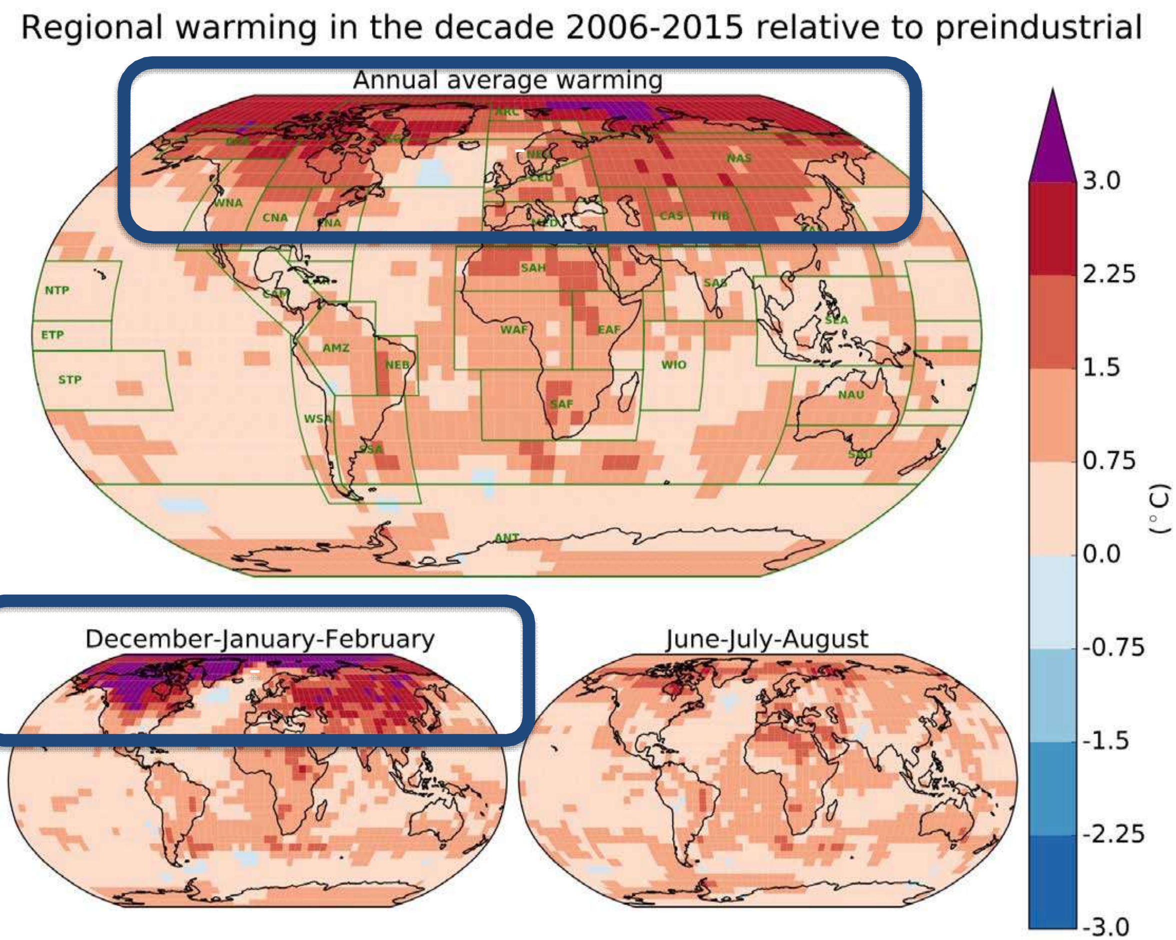
Warming so far



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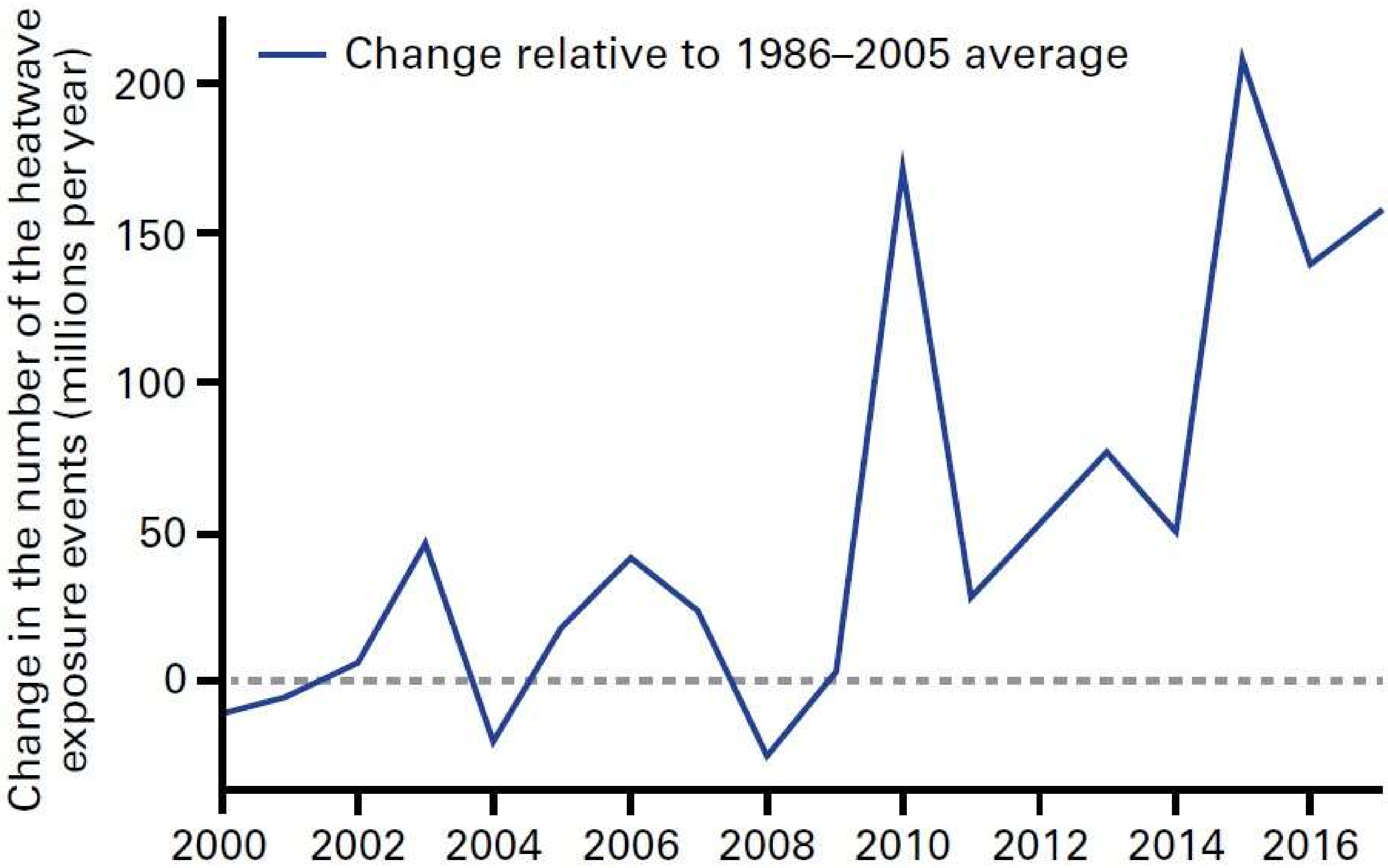
Source: IPCC Special Report on Global Warming of 1.5°C

Heatwave exposure increase 2000-2018



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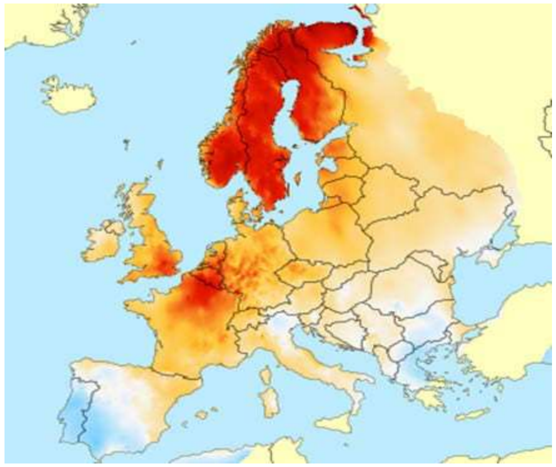
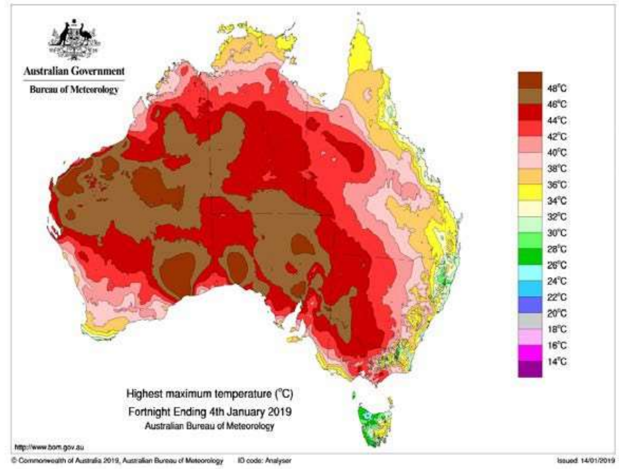
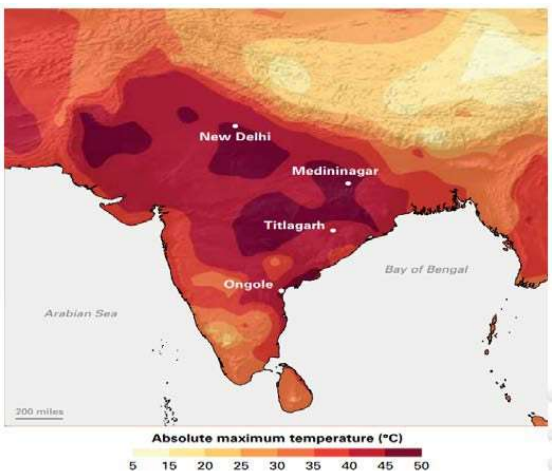
Some heatwave examples

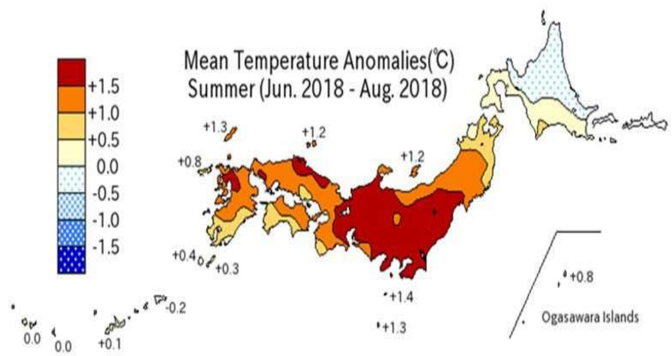


Europe, Summer 2018 & 2019



Australia, 2018/2019



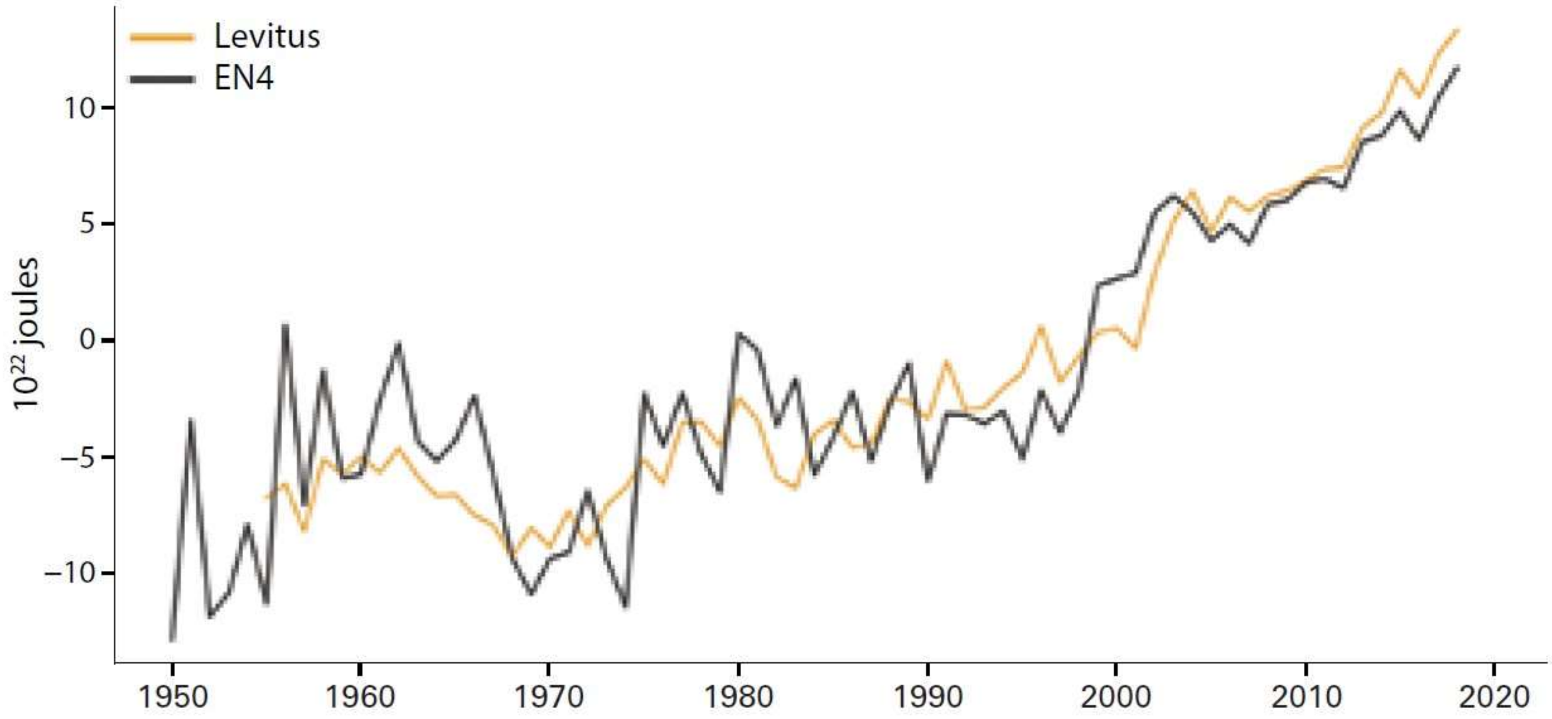


WMO OMM India and Pakistan, Summer 2015

Japan, July 2018

Heat content of the oceans 0-700 m vs. 1981-2010 mean

~93 % of extra heat stored in the oceans



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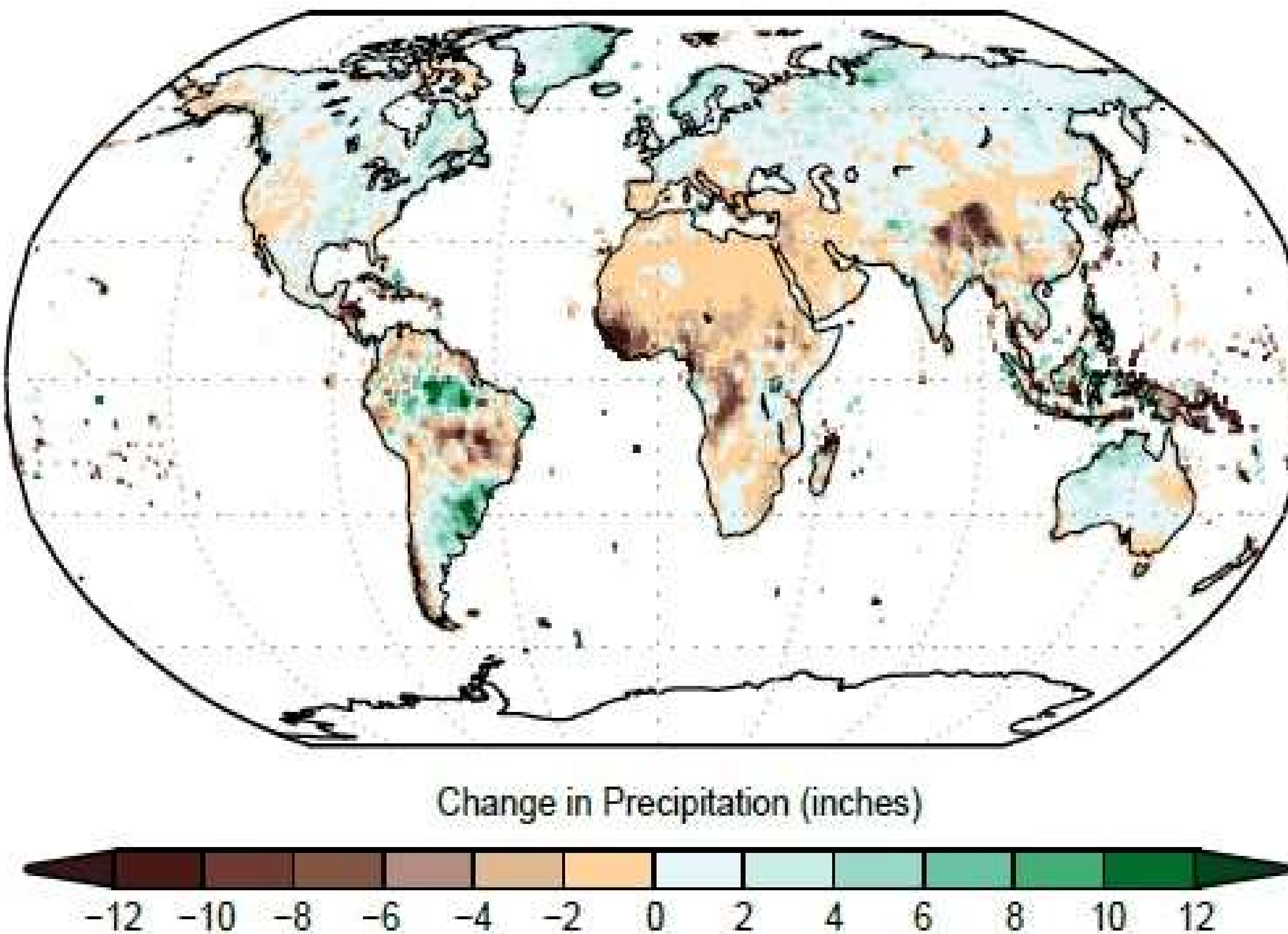
Global precipitation 1986–2015 vs. 1901–1960



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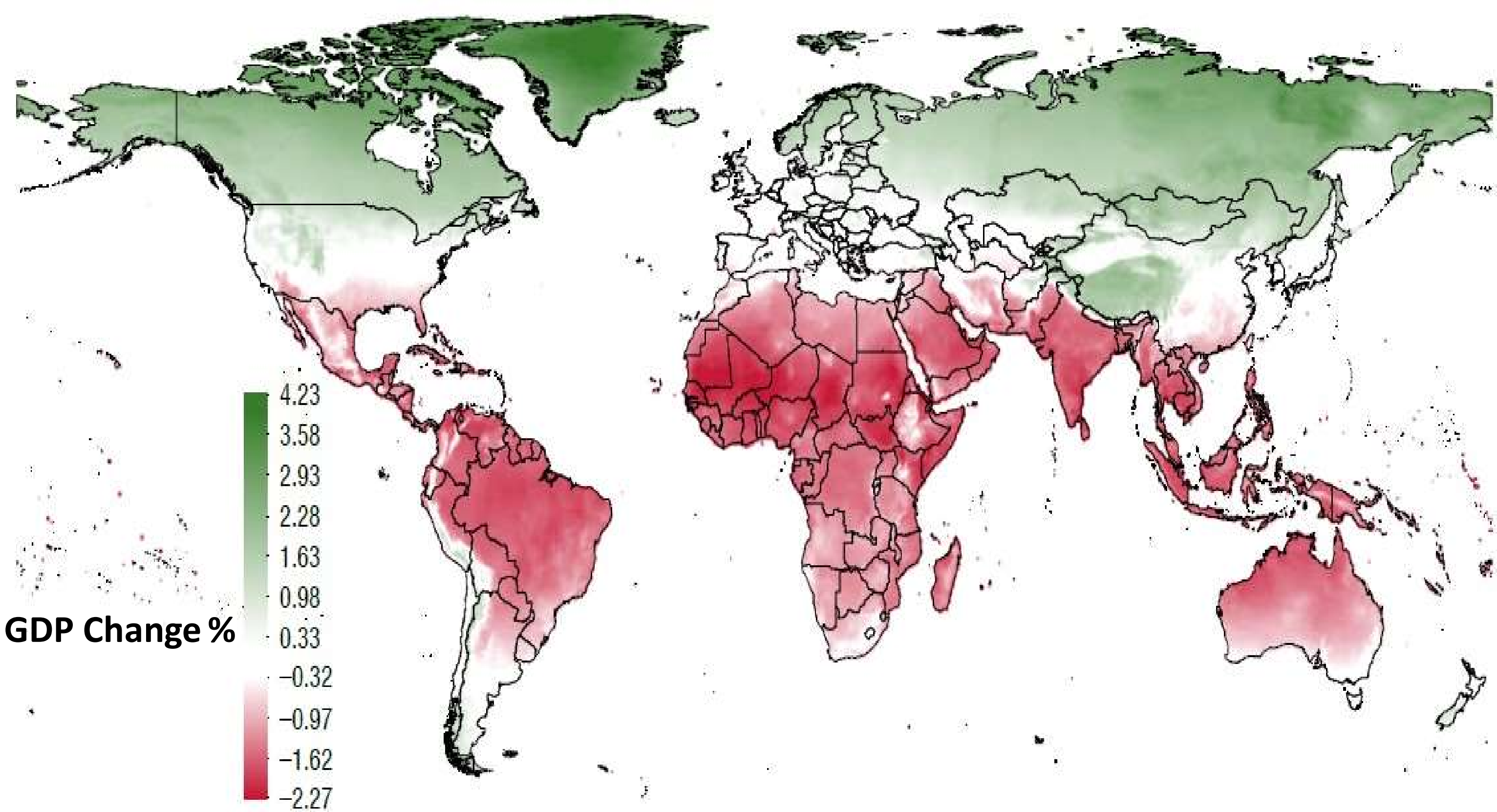
Uneven economic impact of current warming

Effect of 1°C temperature increase on per capita output



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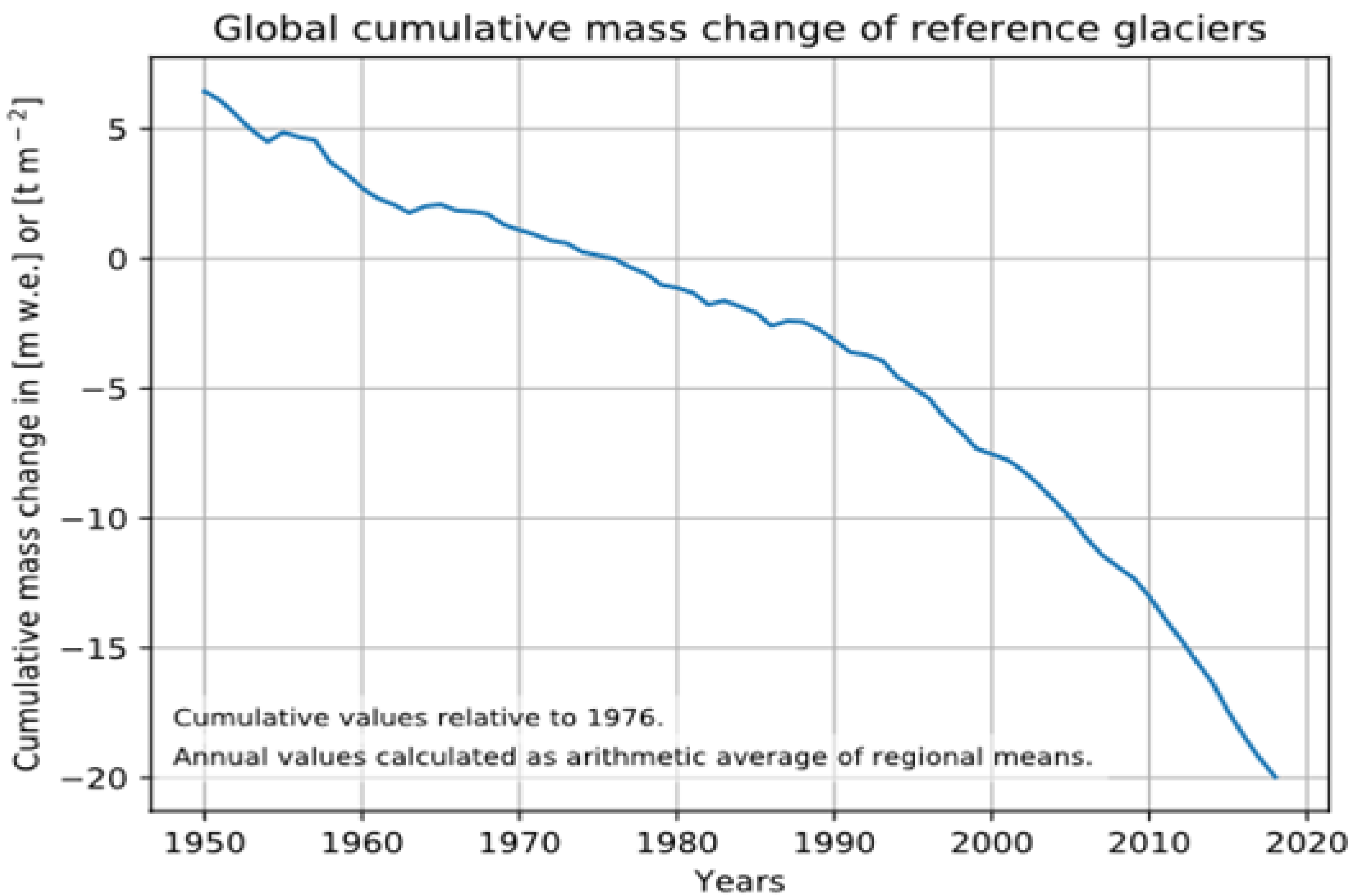
Source: International Monetary Fund (IMF) World Economic Outlook

Melting of global 31 glaciers 1950-2018



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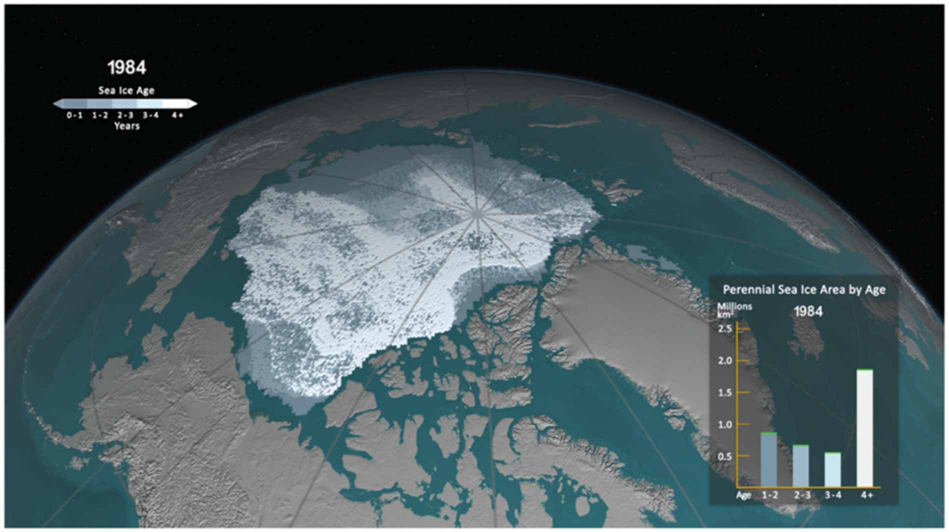
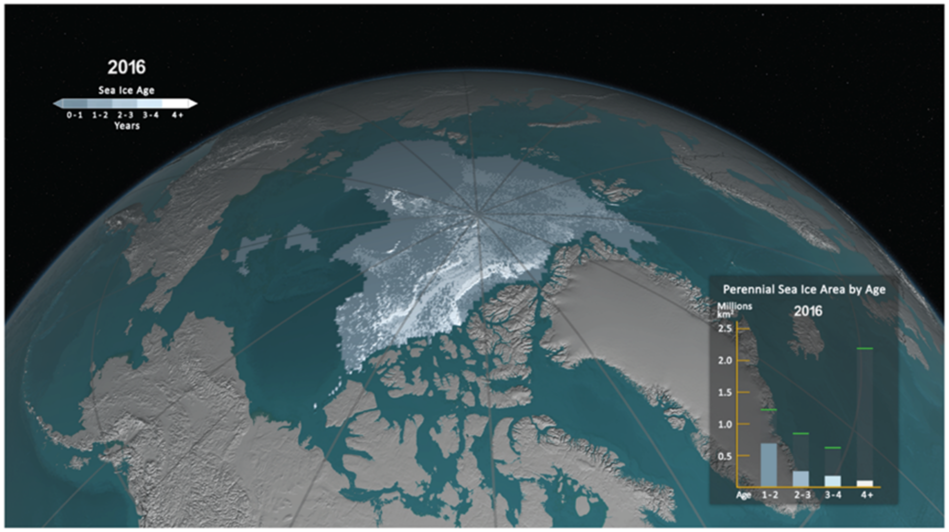
Largest changes in the Arctic

Multi-year ice

1984



2016



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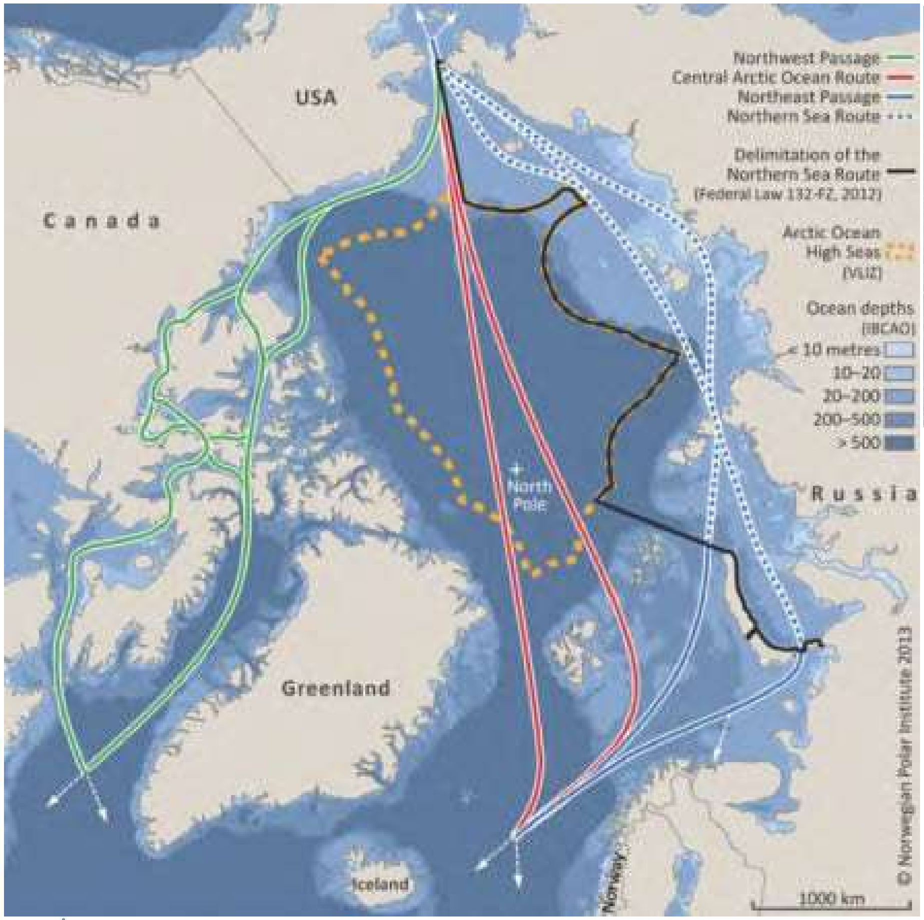
The Northern sea routes



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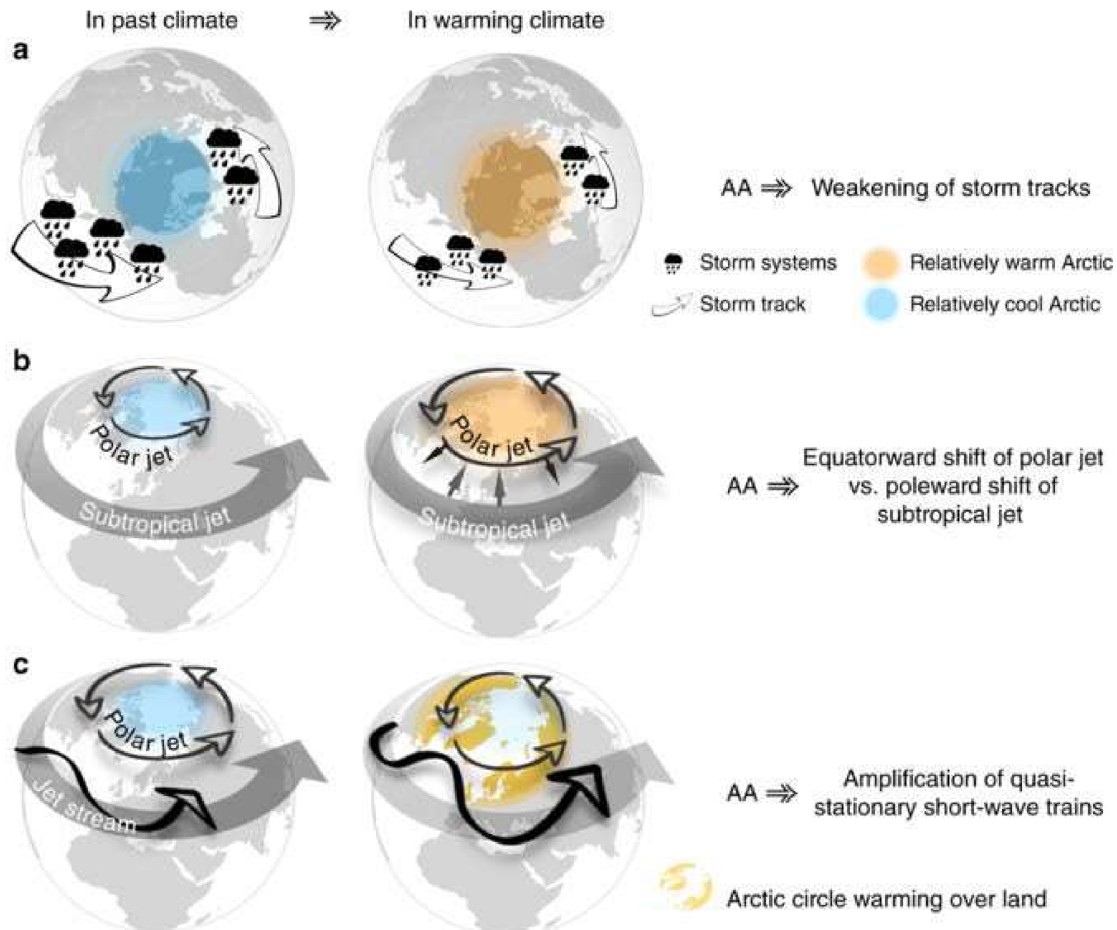
Influence of Arctic on mid-latitude weather



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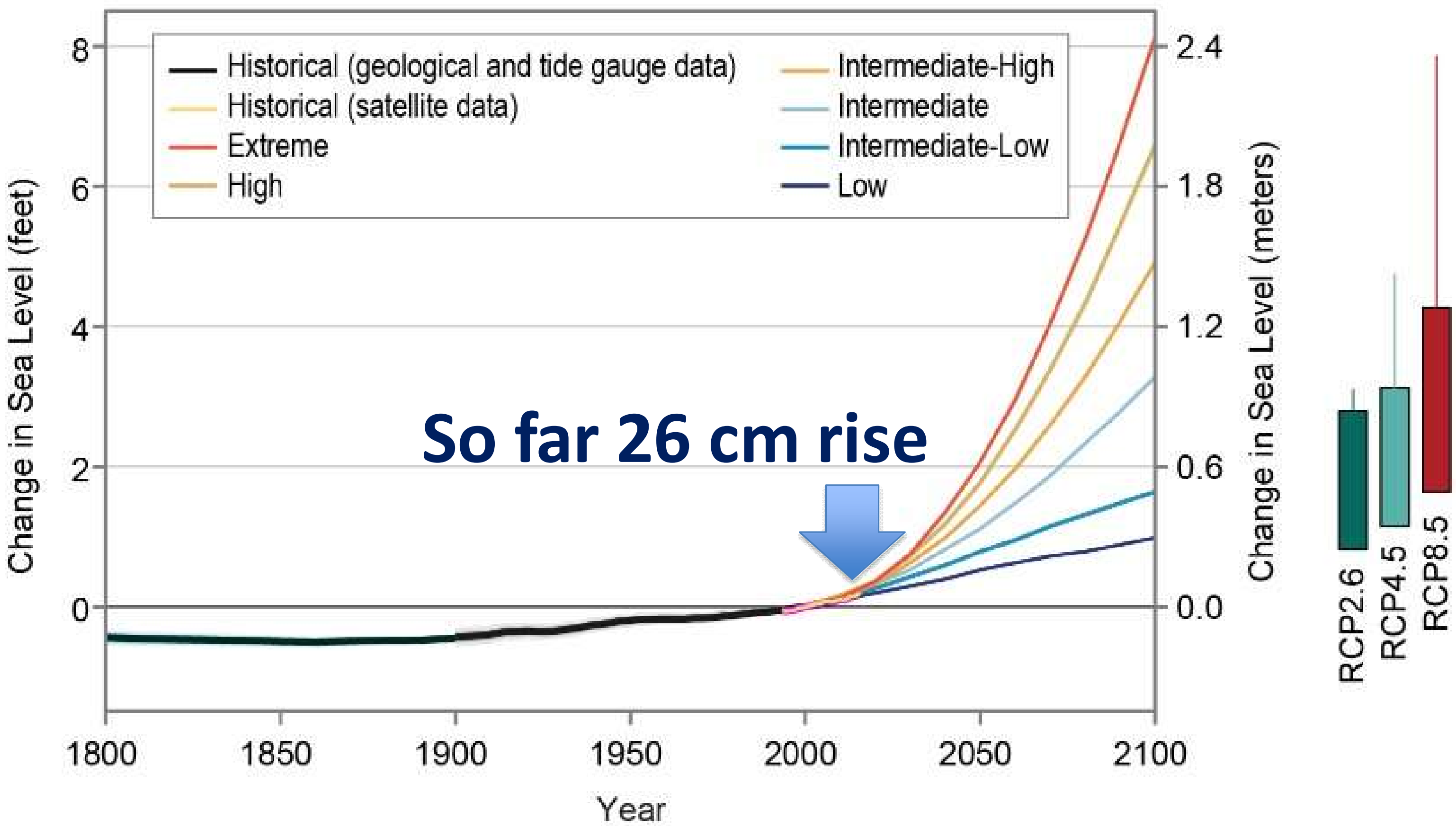
Coumou et al, Nature Communications **volume 9**, Article number: 2959 (2018)

Emissions-sea level rise 1800-2100



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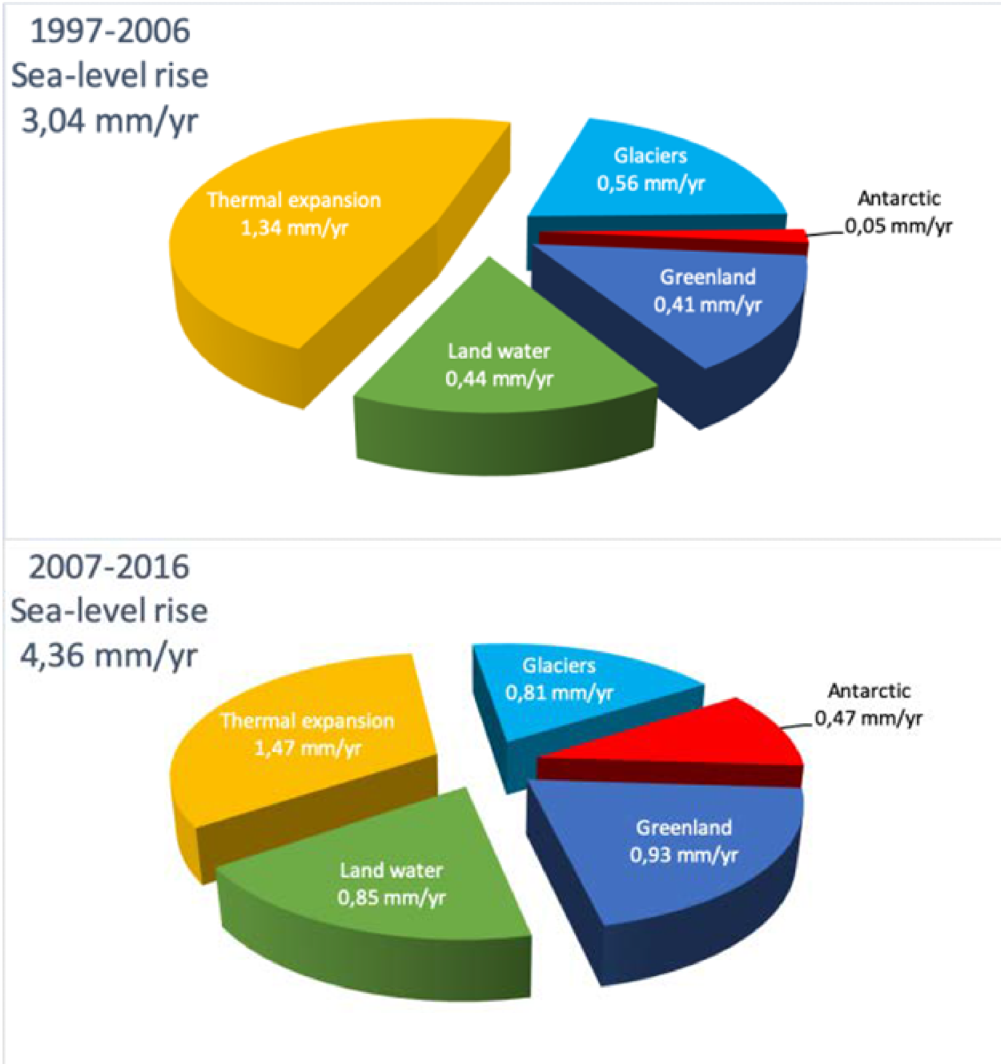
Factors behind sea level rise



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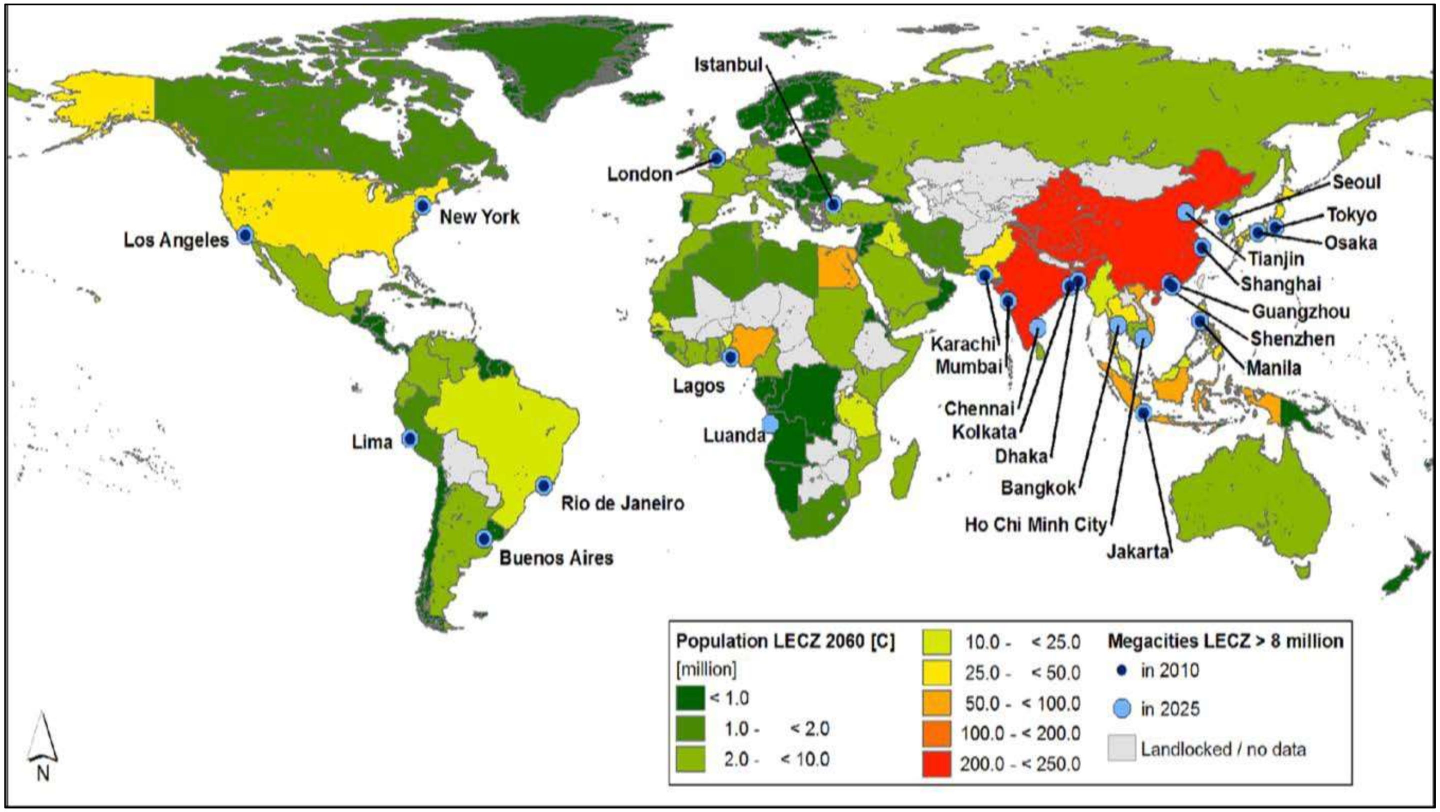
Population in low elevation coastal zones 2060 projections



Source: Neumann, Vafeidis, Zimmermann, Nicholls 2015

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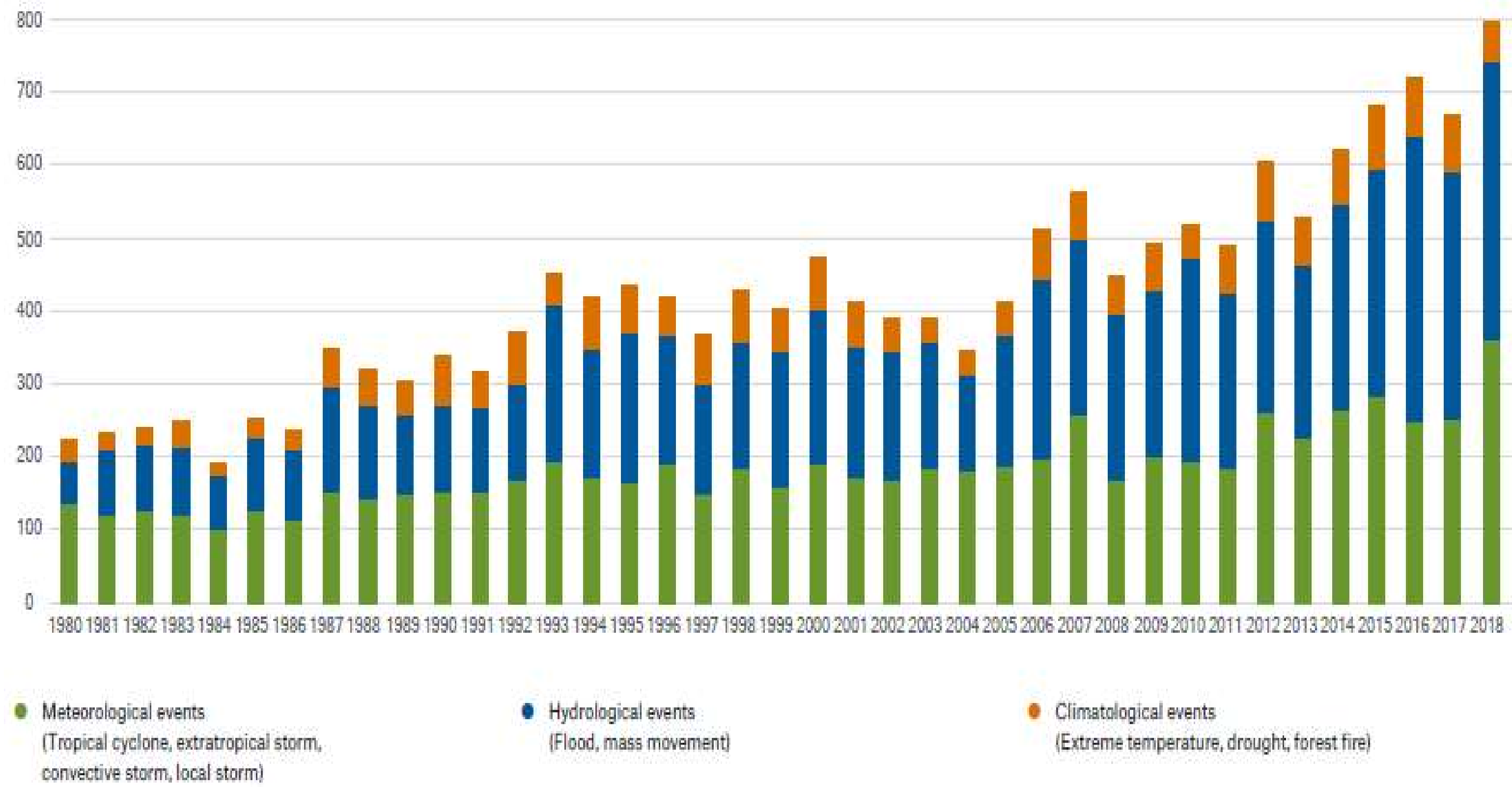
Loss events worldwide 1980 – 2018

Number



Accounted events have caused at least one fatality and/or produced normalised losses ≥ US$ 100k, 300k, 1m, or 3m (depending on the assigned World Bank income group of the affected country).

Source: Munich Re

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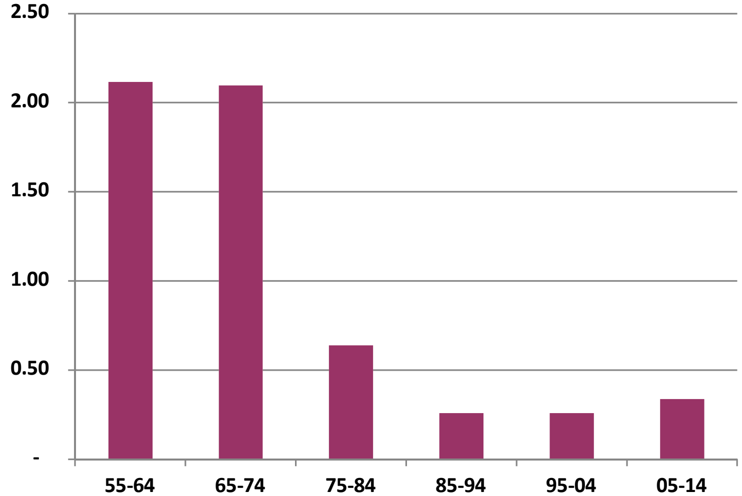
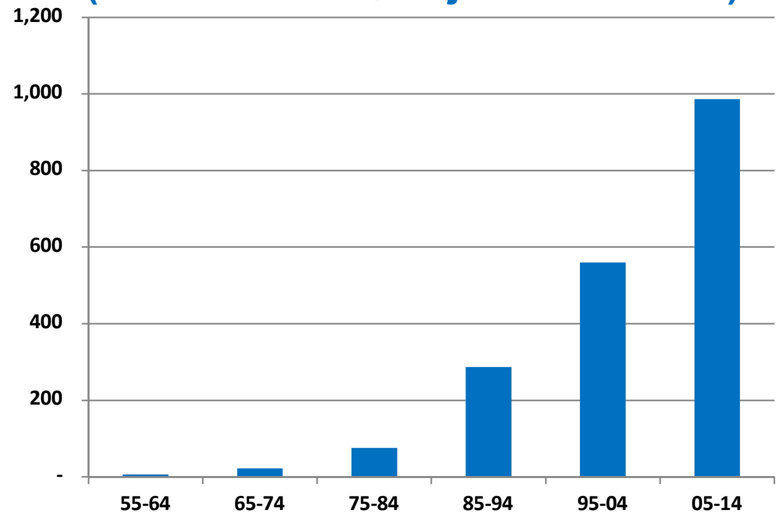
Impacts of hydrometeorological and climatological hazards (1955–2014)

Human losses by decade (millions)



Economic losses by decade (billions of US$ adjusted to 2013)



Reduction of the number of victims thanks to greater effectiveness of early warning systems and prevention measures

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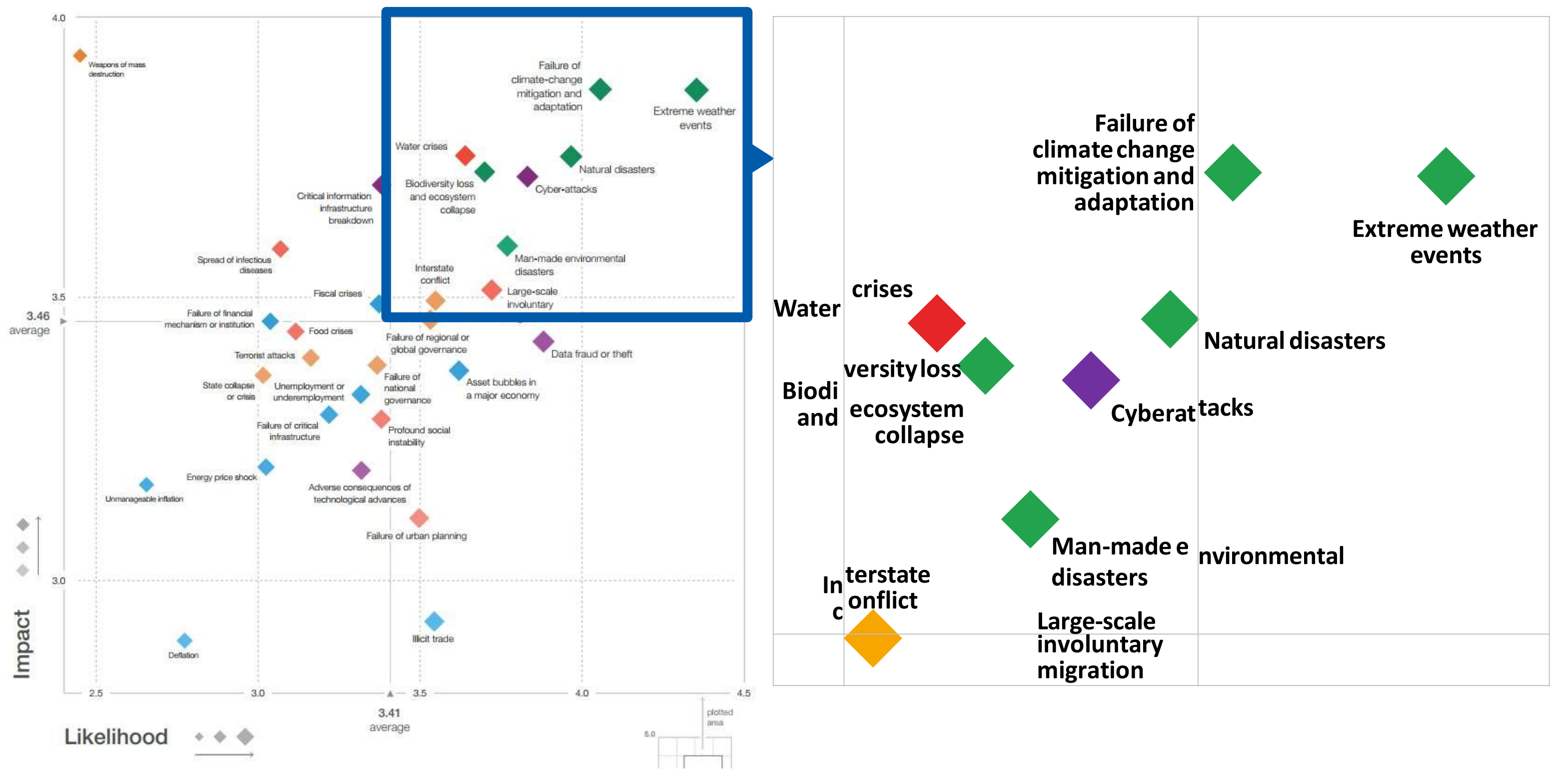
Most expensive disasters 1998-2017

Name and date	Countries/territories affected	Sum of Total Damages (billion US$)
Hurricane Katrina – Sep.2005	USA	156.3
Hurricane Harvey – Aug. 2017	USA	95.0
Hurricane Irma – Sep.2017	USA & Caribbean Islands	80.8
Hurricane Maria – Sep.2017	Caribbean Islands& USA	69.7
Hurricane Sandy – Oct. 2012	USA & Caribbean Islands	53.5
Flood – July & Aug. 1998	China	44.9
Flood – Aug.2011 to Jan. 2012	Thailand	43.4
Hurricane Ike – Sep.2008	USA & Caribbean Islands	36.3
Hurricane Ivan – Sep.2004	USA, Caribbean Islands & Venezuela	29.9
Hurricane Wilma – Oct.2005	USA, Mexico, Belize, Honduras & Caribbean Islands	25.0

Largest relative losses 1998-2017

Name and date	Countries/territories affected	Economic losses (billion US$)	Economic losses (%GDP)
Hurricane Irma – Sep.2017	Sint Maarten	2.50	797
Hurricane Irma – Sep.2017	Saint Martin	4.10	584
Hurricane Irma – Sep.2017	British Virgin Islands	3.00	309
Hurricane Maria – Sep.2017	Dominica	1.46	259
Hurricane Ivan – Sep.2004	Grenada	1.15	148
Hurricane Ivan – Sep.2004	Cayman Islands	4.43	129
Hurricane Georges – Sep.1998	Saint Kitts and Nevis	0.60	110
Hurricane Erika – Aug. 2015	Dominica	0.50	90
Hurricane Mitch – Oct. & Nov. 1998	Honduras	5.68	73
Hurricane Maria – Sep.2017	Puerto Rico	68.00	69

Biggest risks for the world economy 2019



World Economic Forum Global Risks Landscape 2019

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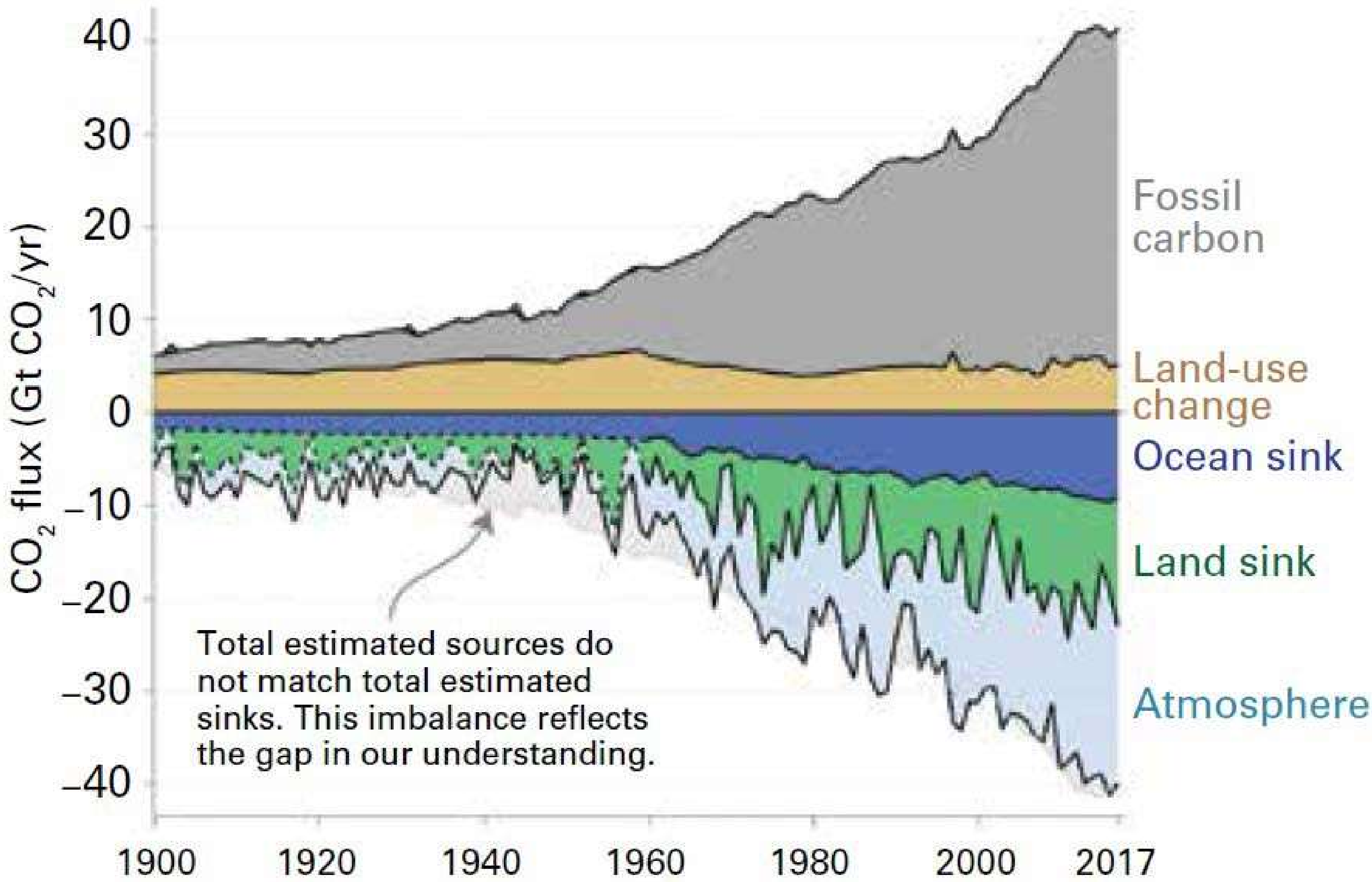
Carbon sinks and sources 1900-2017



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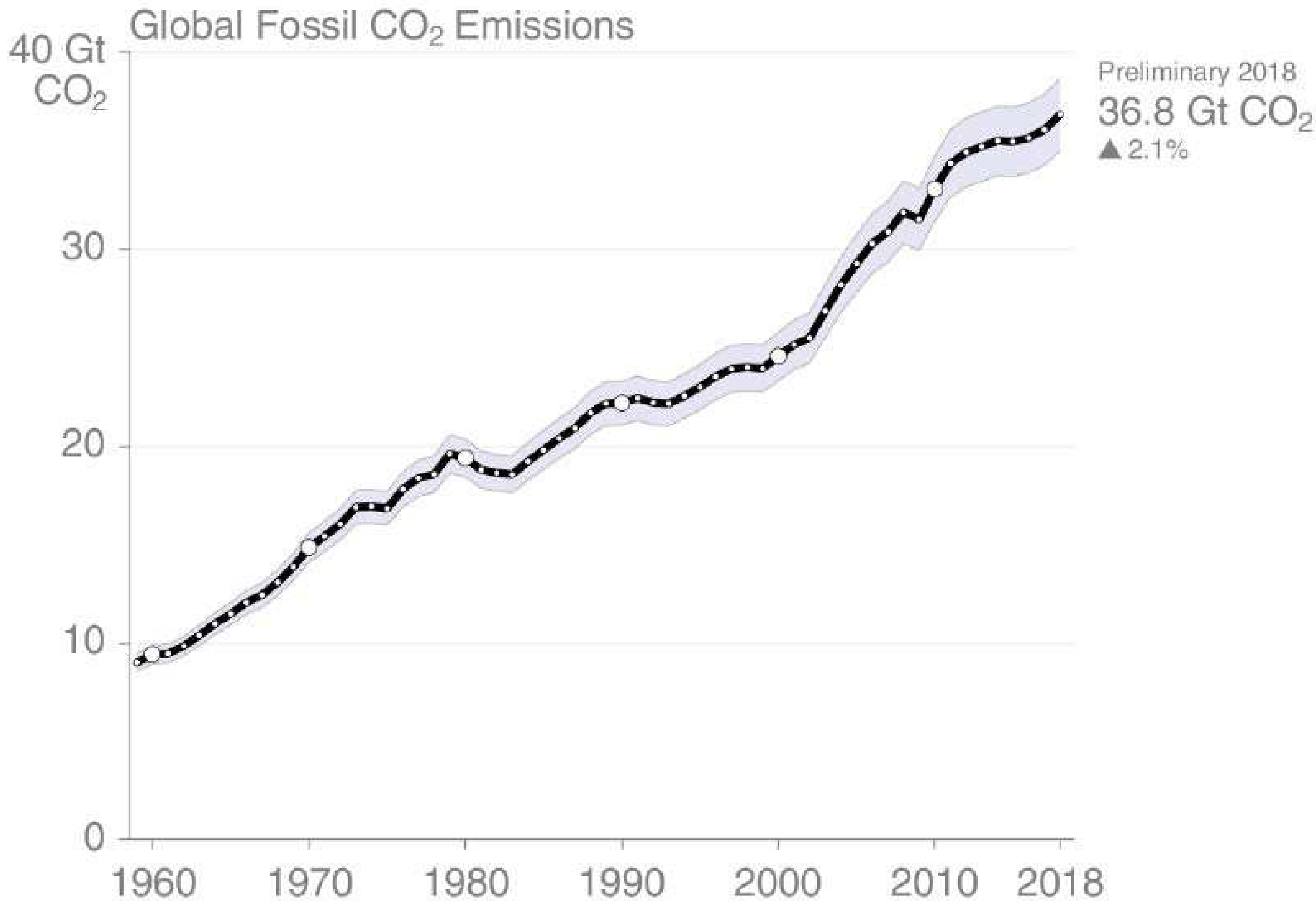
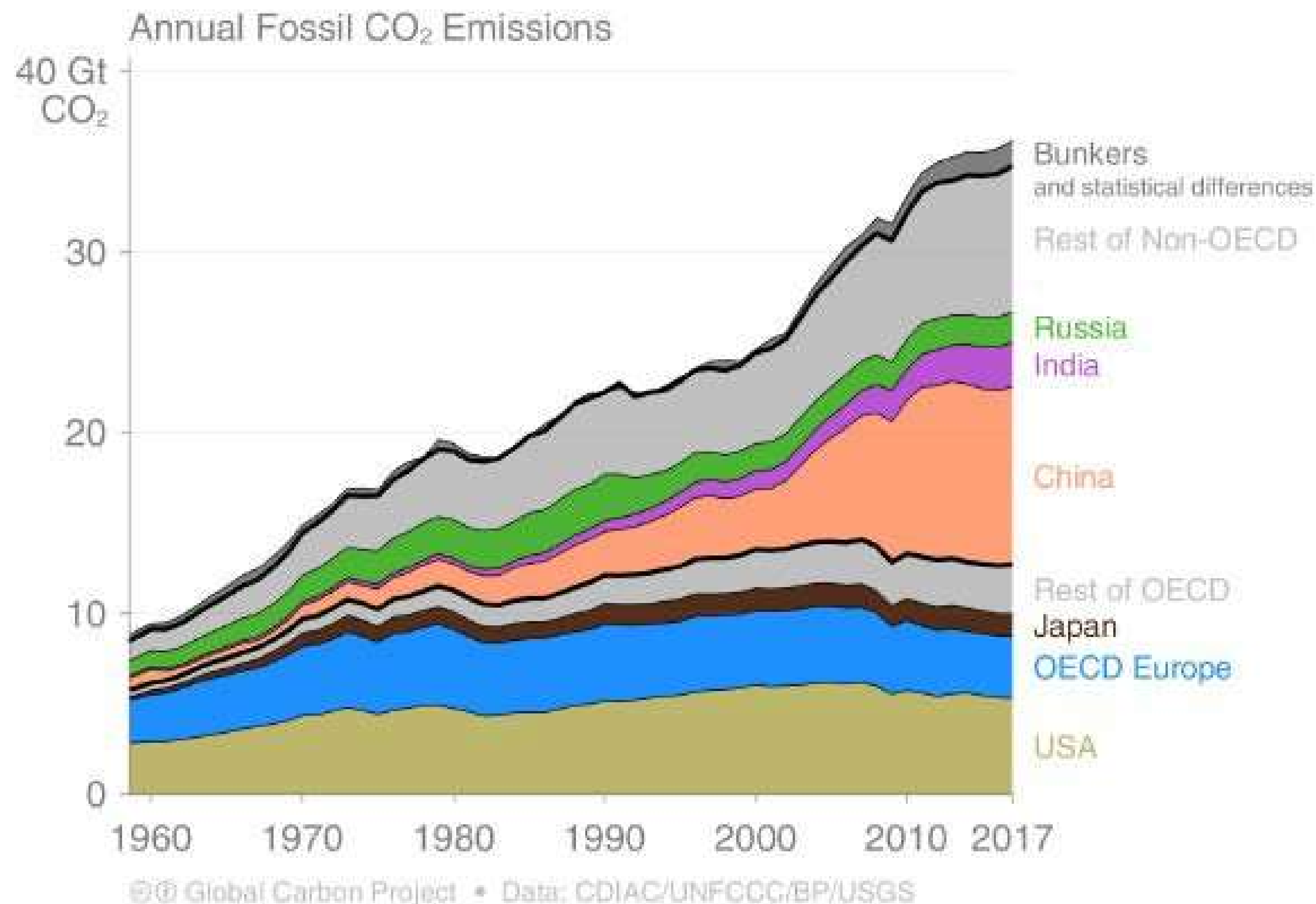
Fossil carbon emissions 1960-2018



CO_2 emissions 1960-2017



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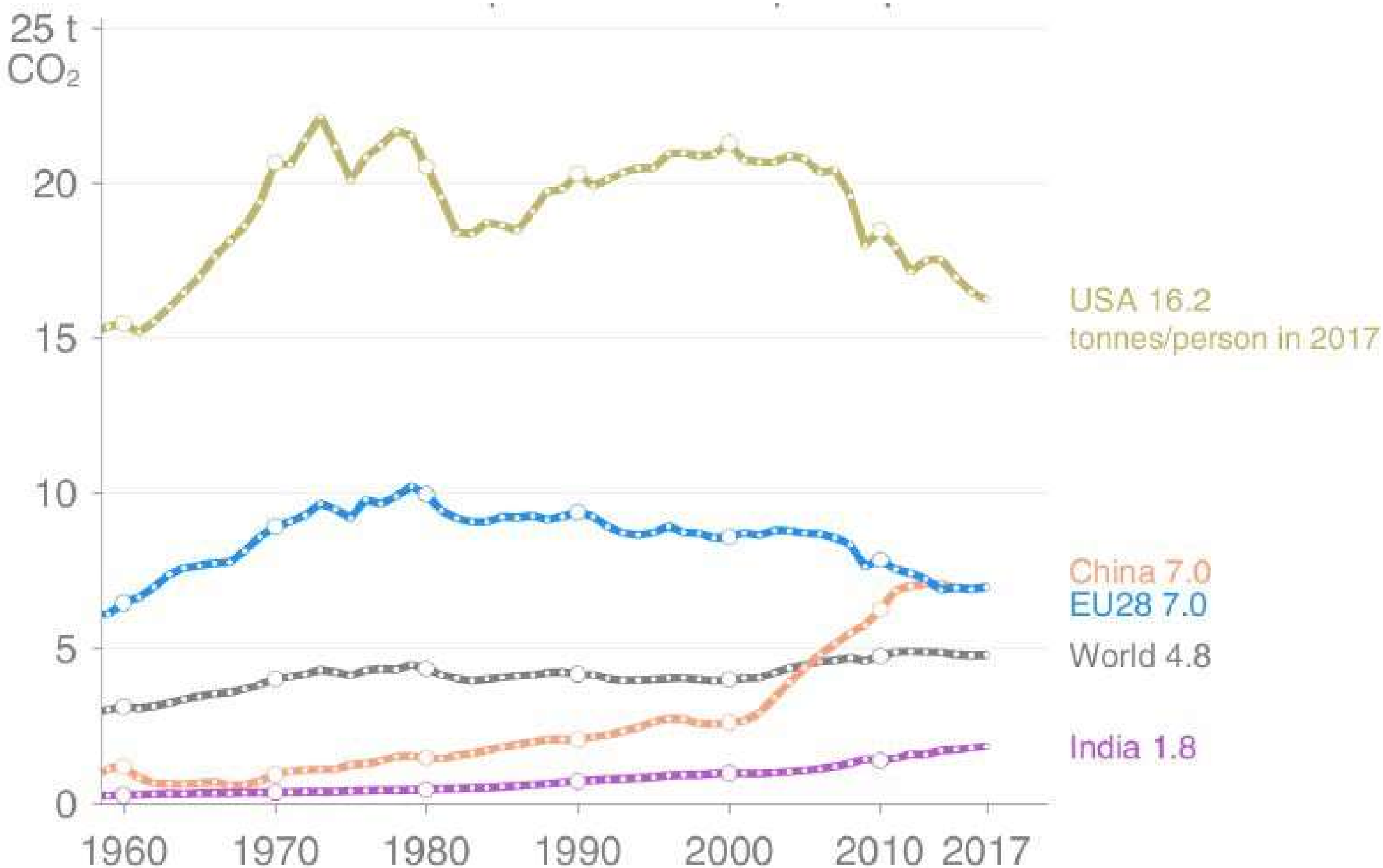
Emissions per capita



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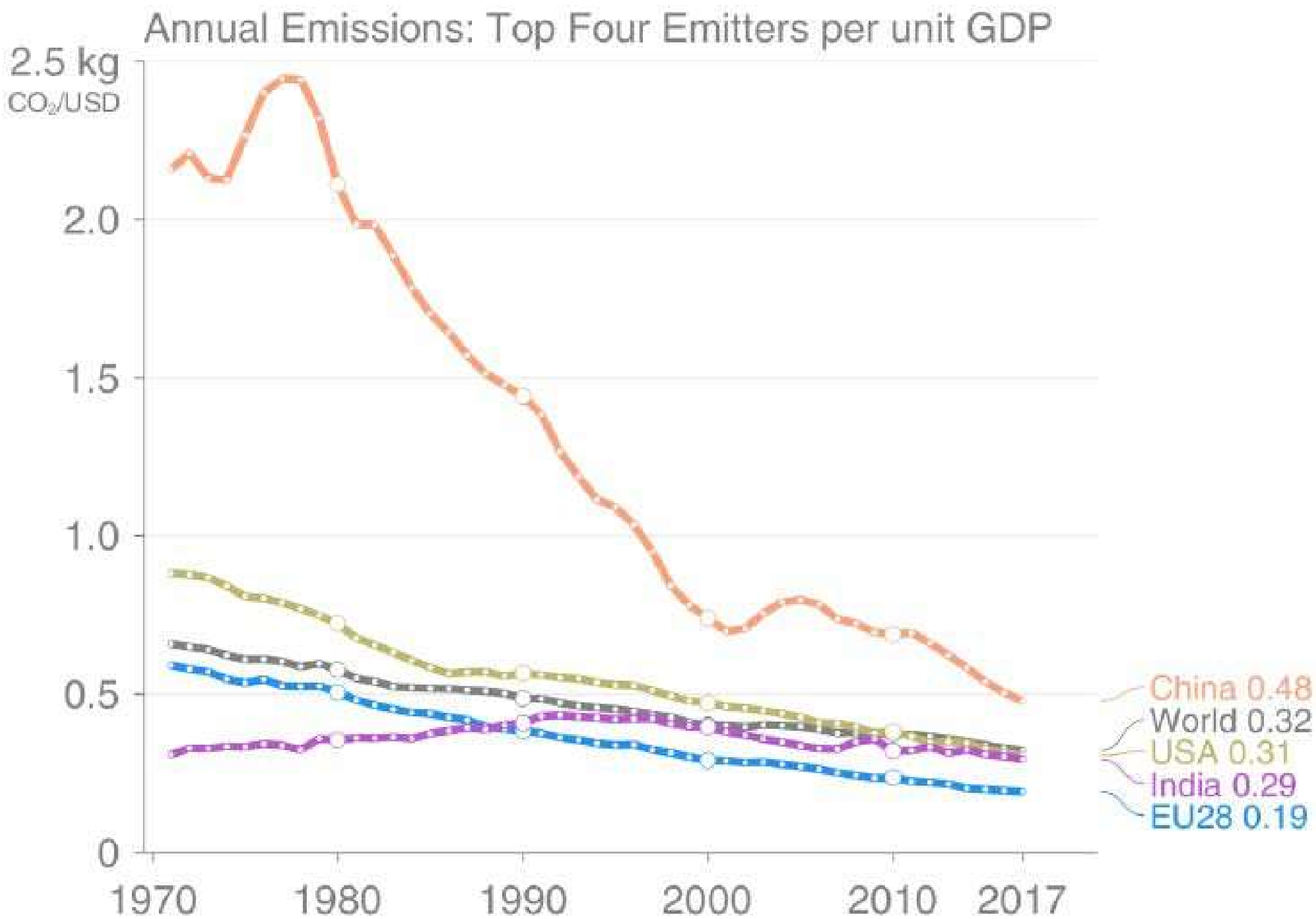
Emissions/GDP



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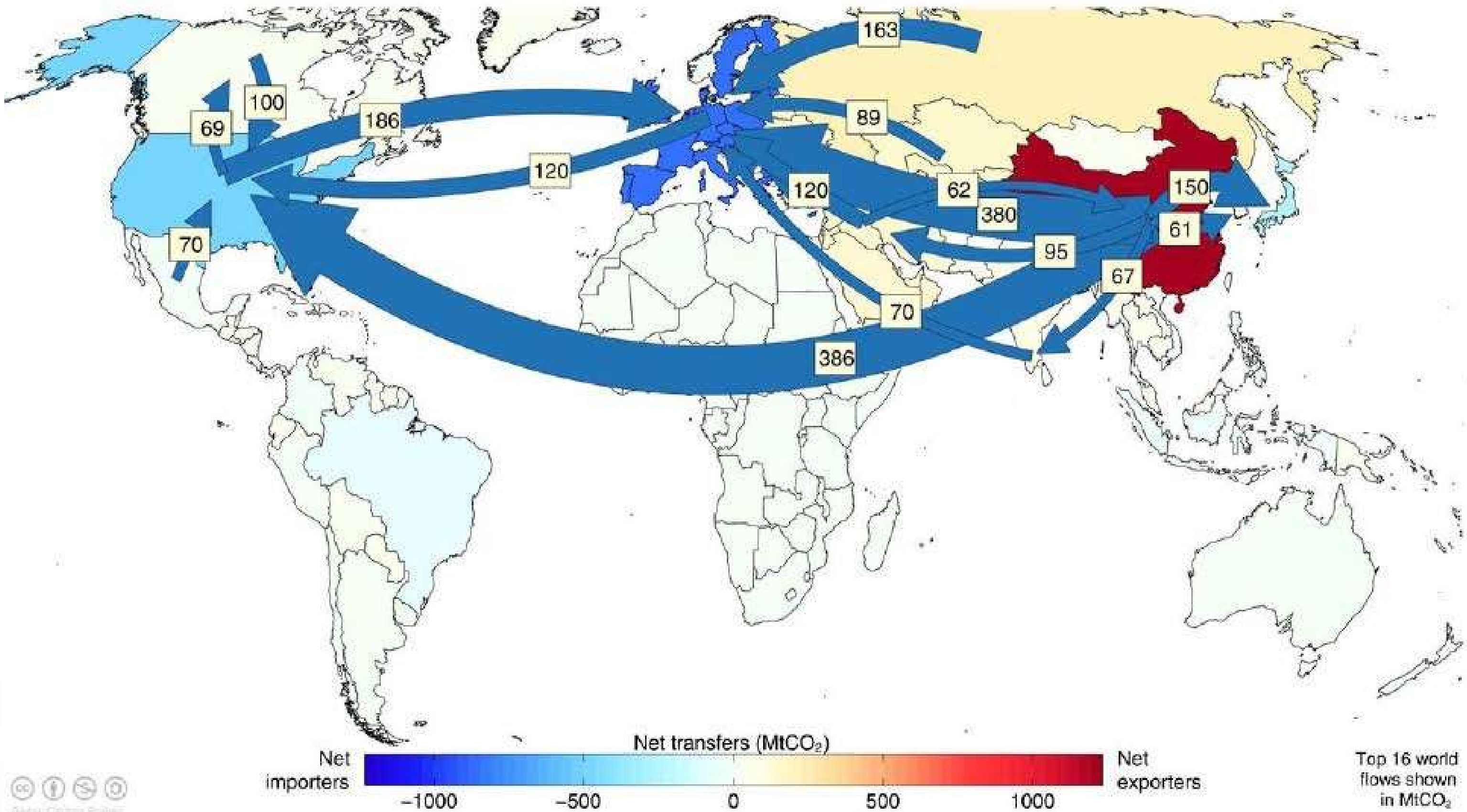
Goods emission flows production/consumption



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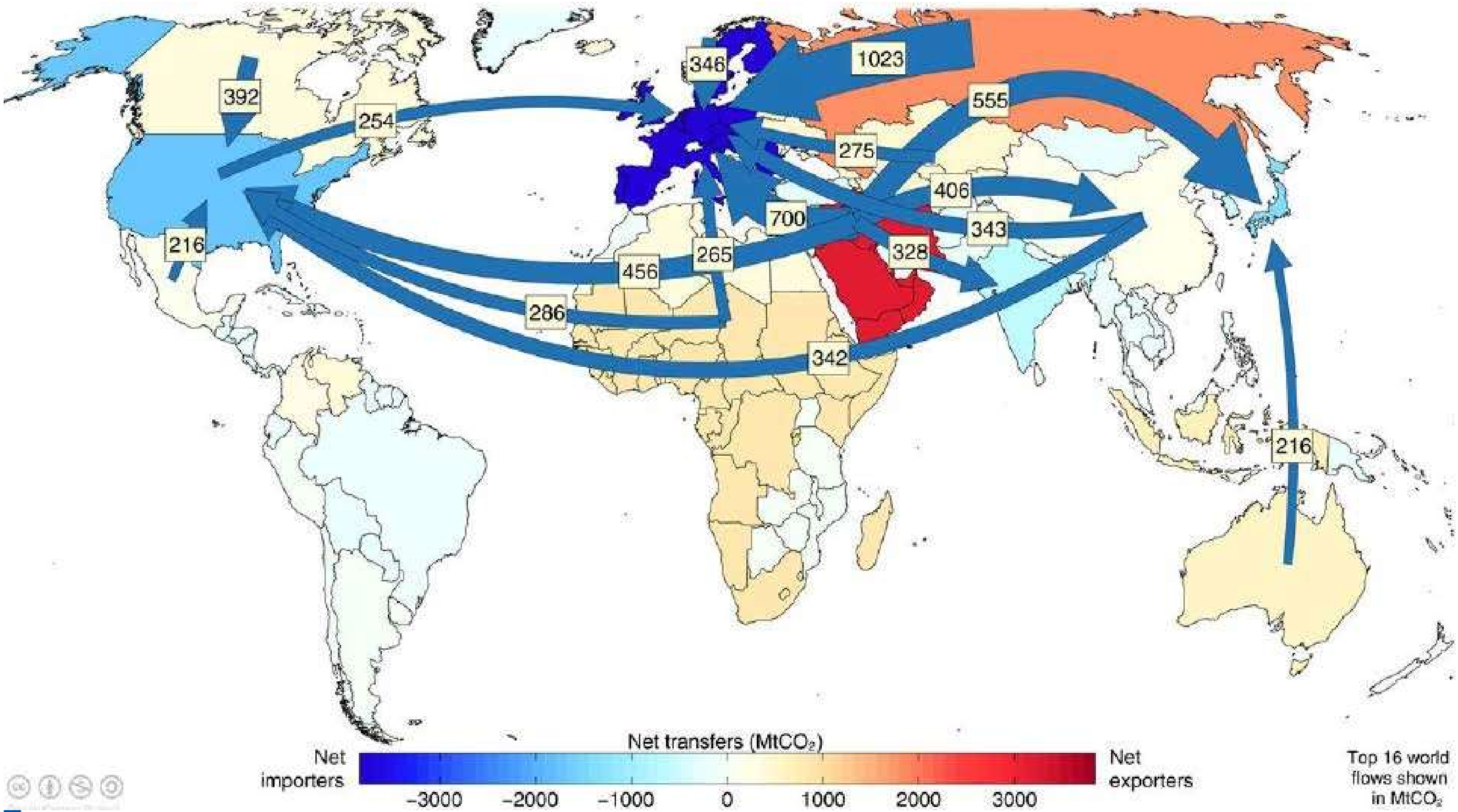
Fossil product flows production/consumption



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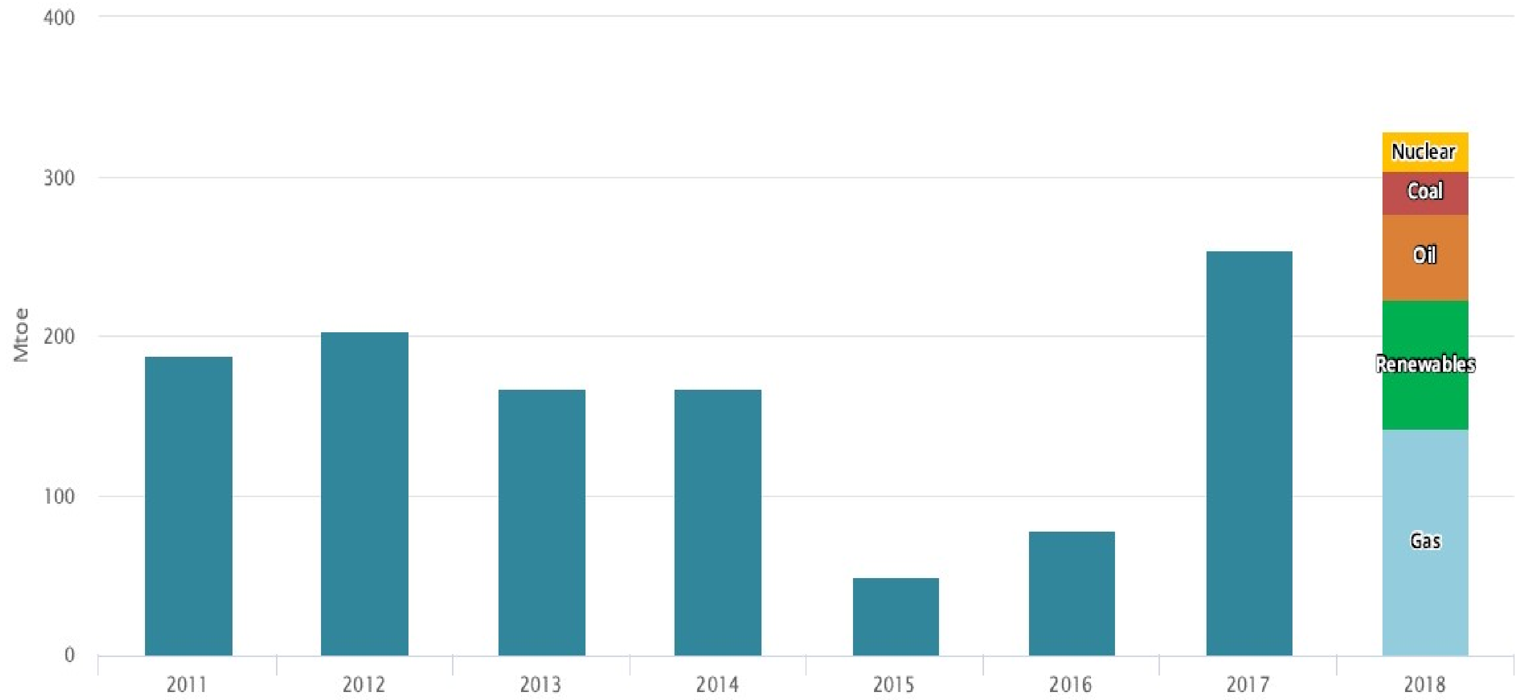
Change in annual global energy demand 2011-18



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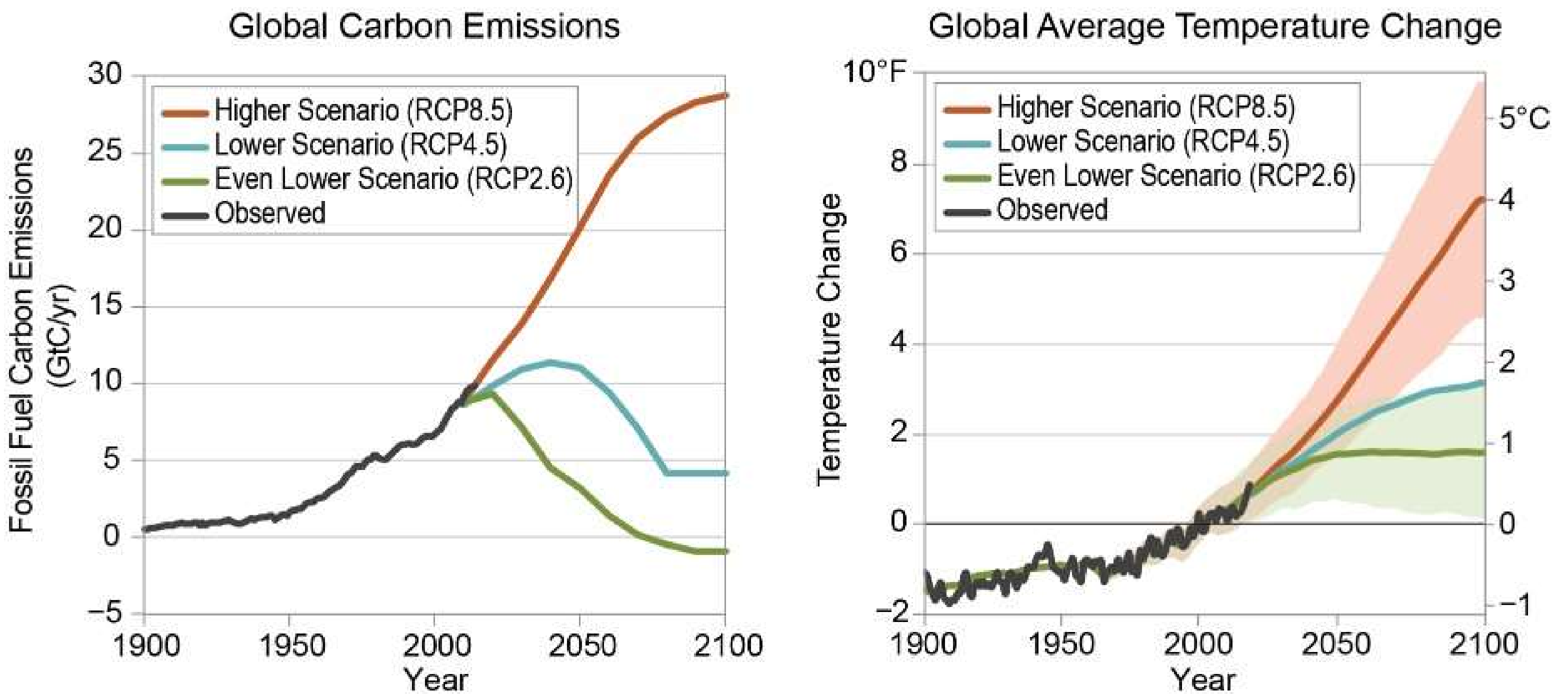
Carbon emissions-temperature



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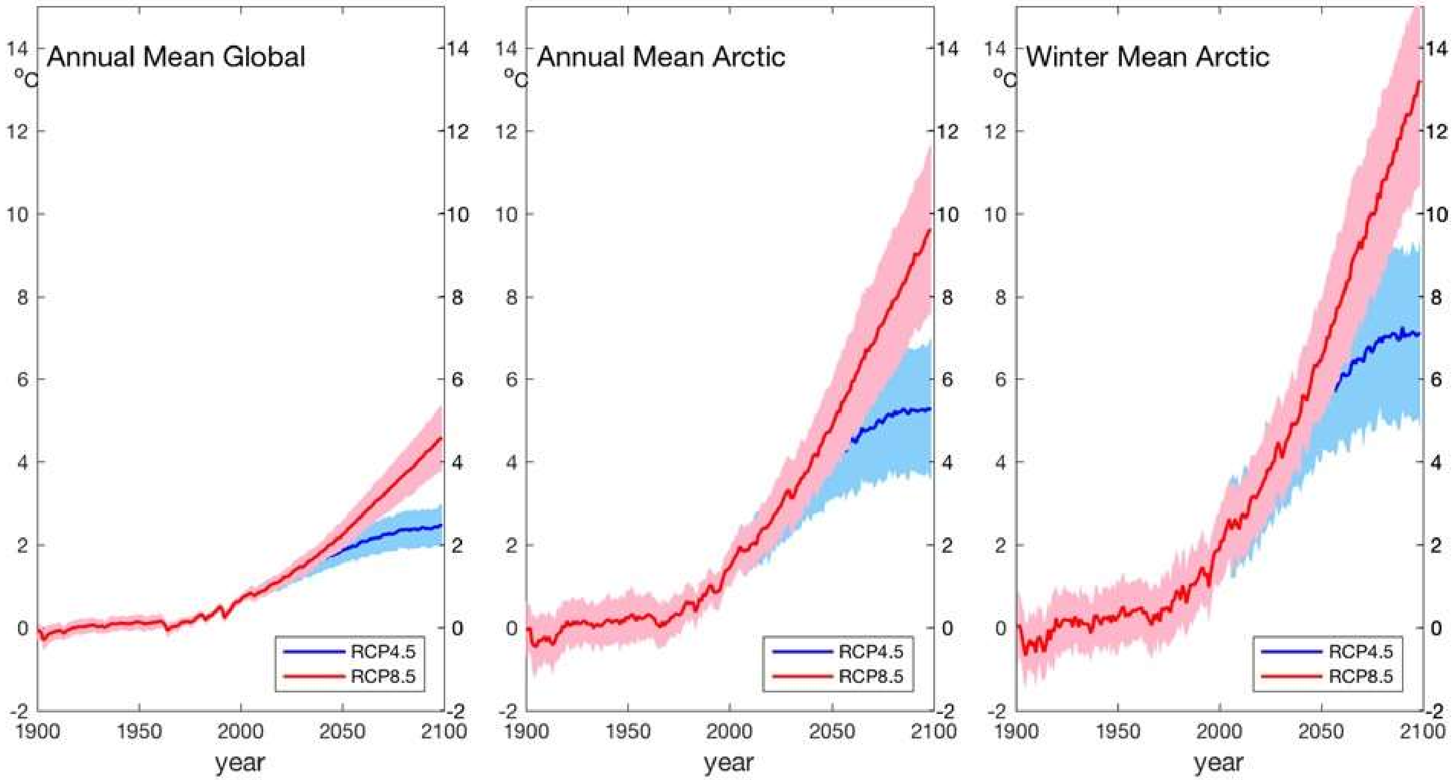
Arctic and global temperatures 1900-2100

Averaged over 36 global climate models
RCP 4.5 (blue)= upper end of Paris COP21 Agreement , RCP 8.5 (red)= business as usual



(modified from AMAP/SWIPA2017)

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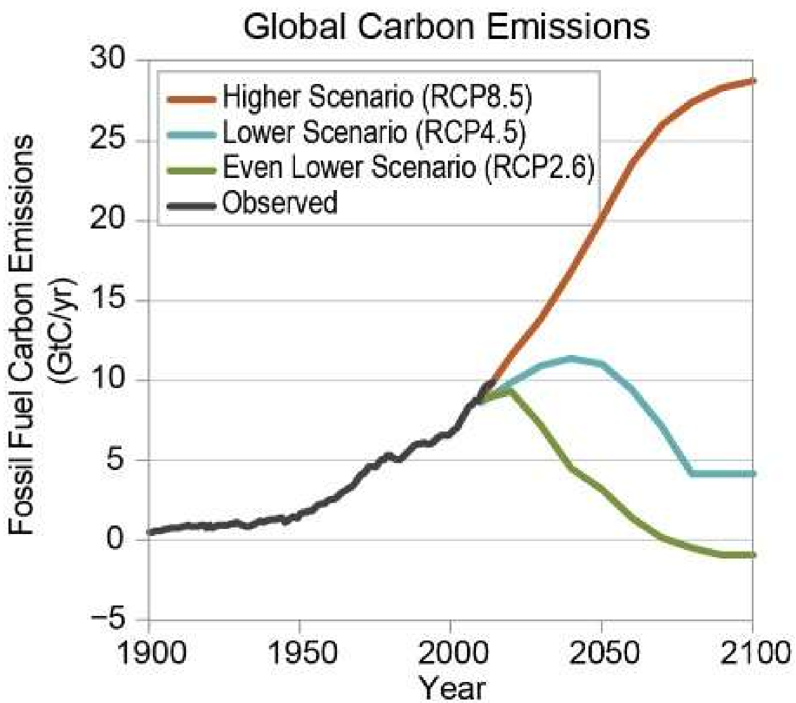
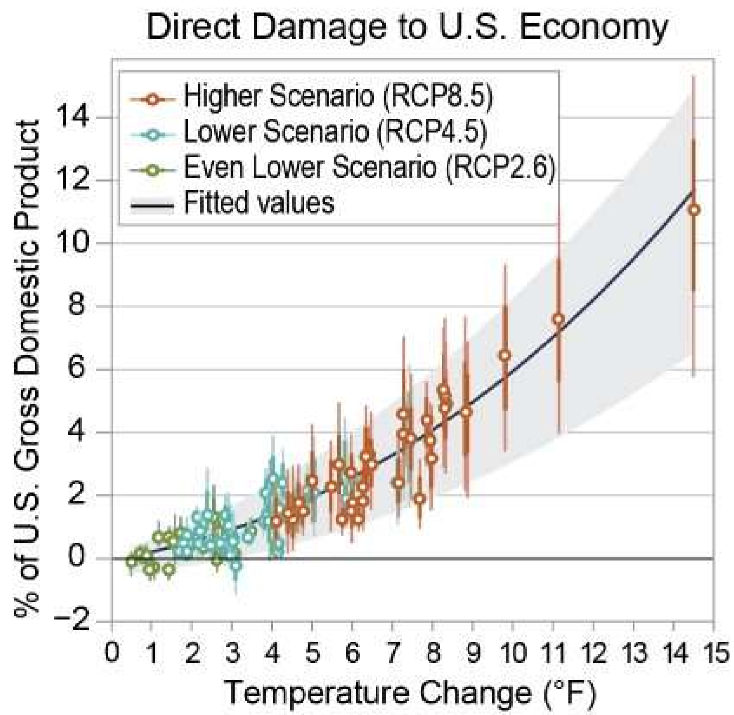
US economy-carbon emissions





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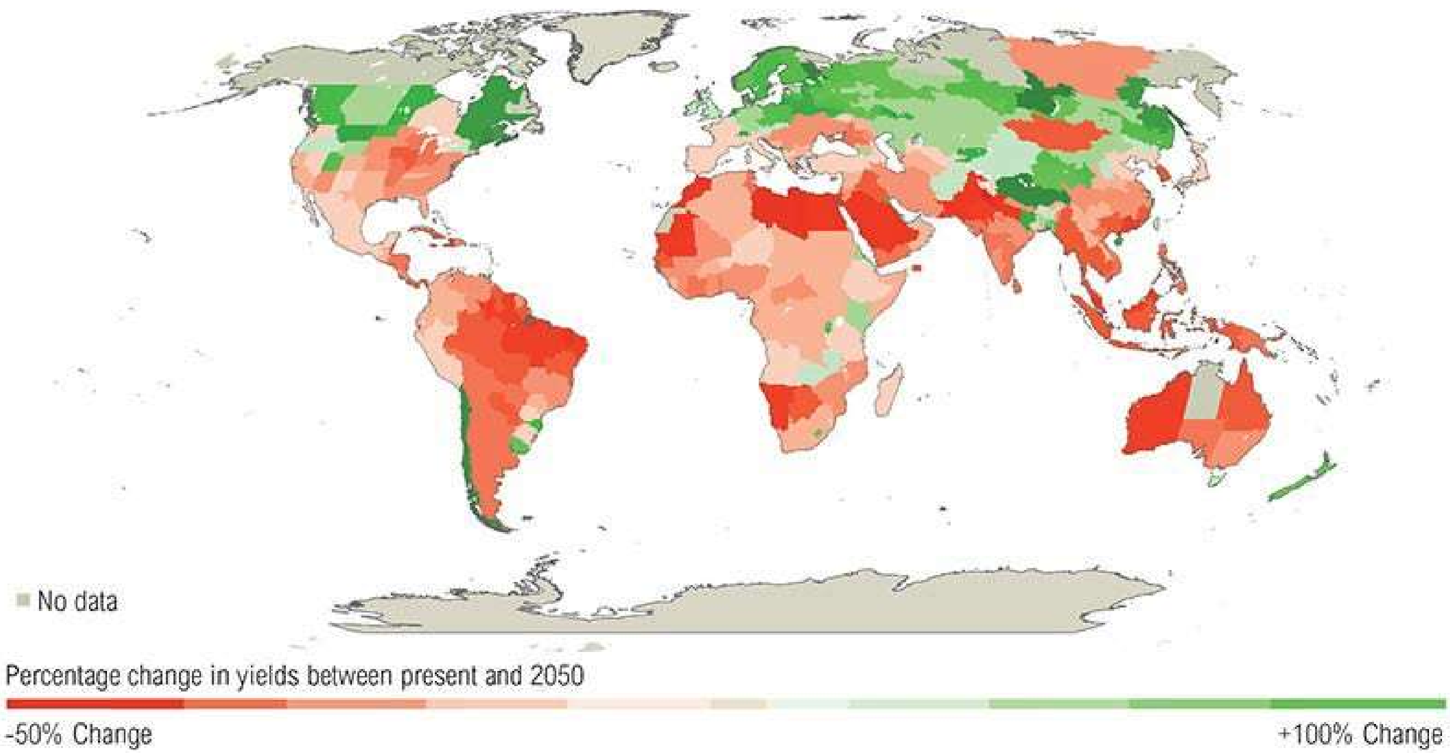
3 C warming major risk for global food security

Loss of crop yield in most parts of the world

Most studies now project adverse impacts on crop yields due to climate change (3°C warmer world)



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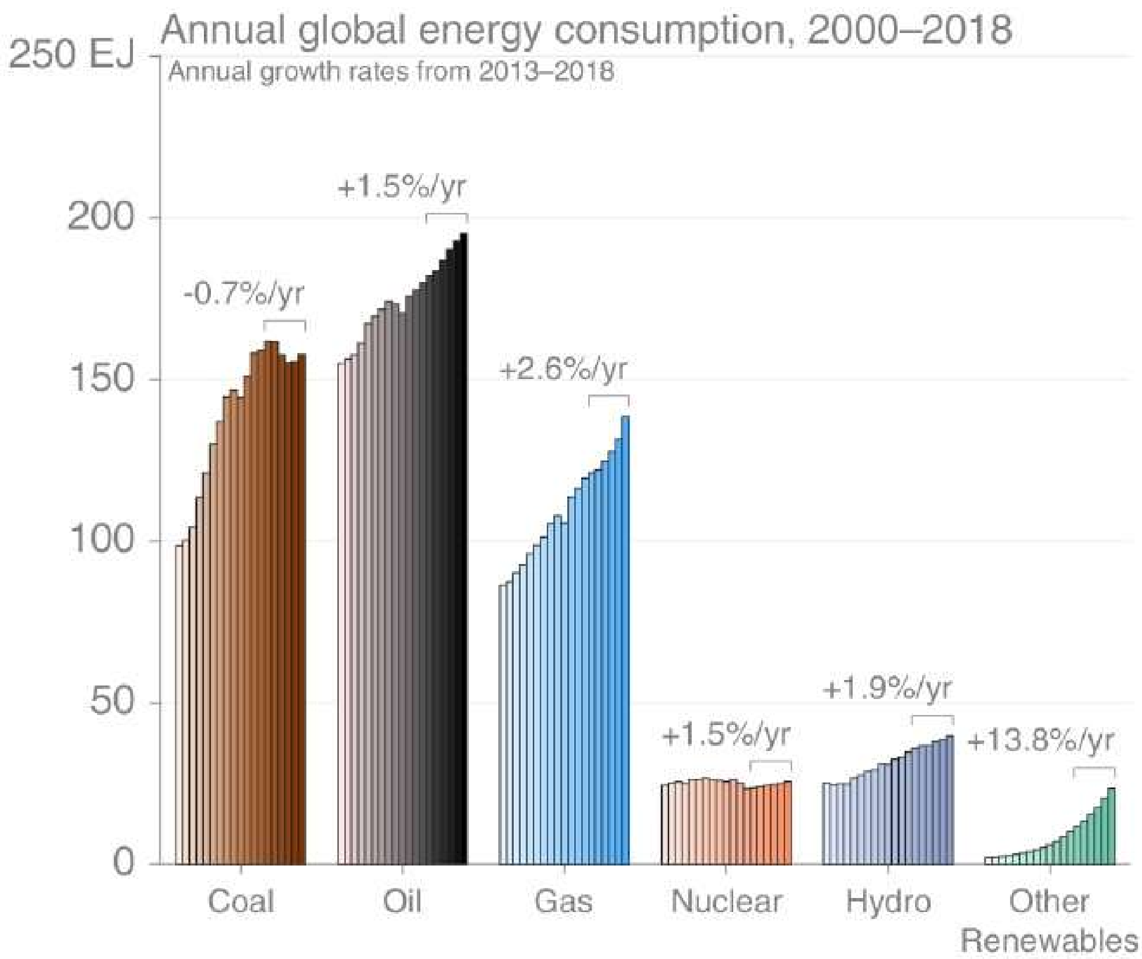
Sources: http://ow.ly/rpfMN

Energy consumption 2000-2018



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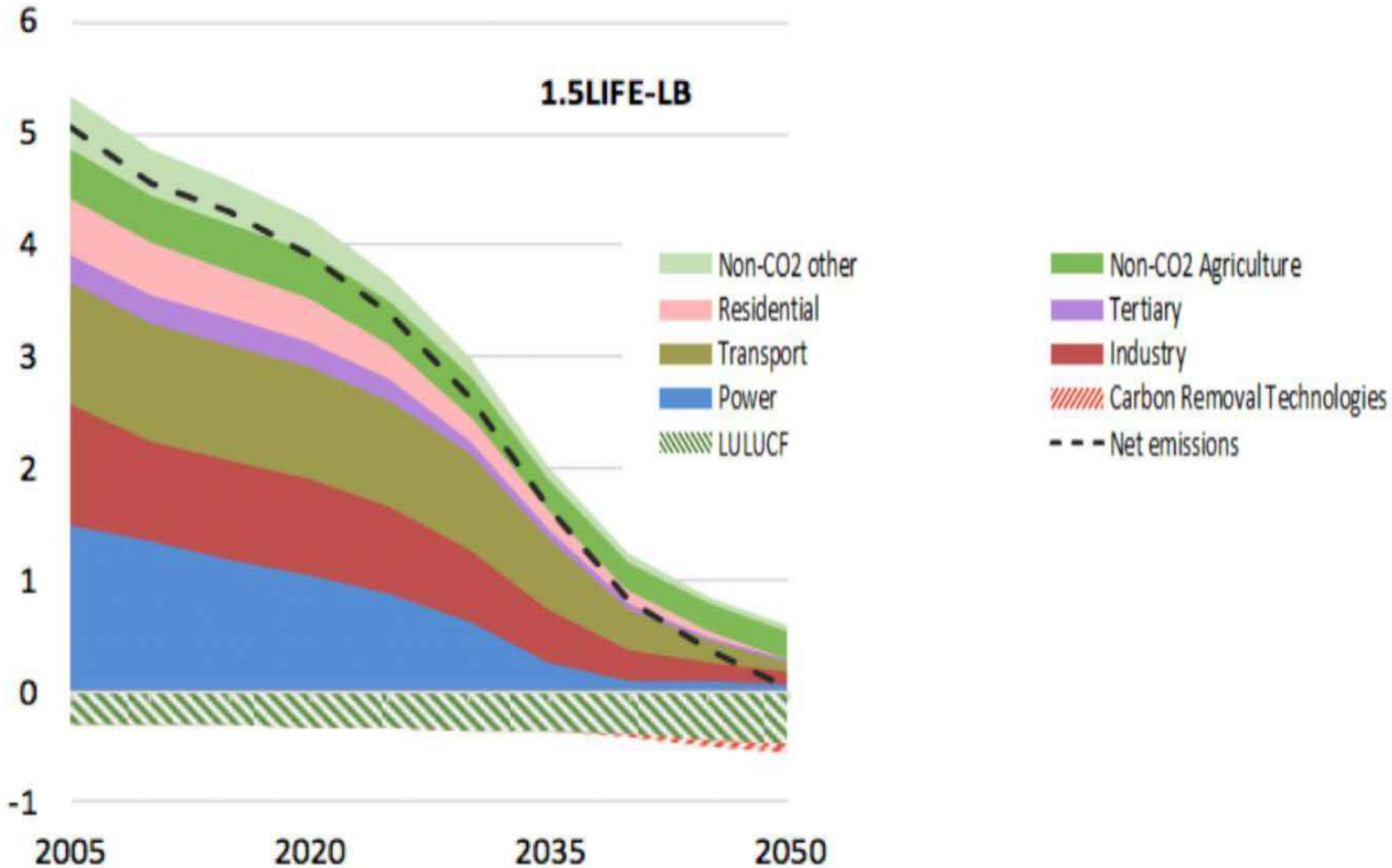
How to be carbon neutral by 2050?



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Climate food for thought

- **Climate is high on the global agenda**: UN, science, disasters, youth, private sector
- **EU has been a key driver** of global mitigation agenda. There is also a trade balance motivation; EU is a fossil energy sparse region.
- 27 % of the Climate Action Summit initiatives by EU Countries, 35 % European. Russia ratified Paris Agreement.
- US states/cities & private sector are active. No new initiatives by India nor China.
- There is a risk for a **stagnation of the Paris Agreement implementation**. Further implementation should be agreed at COP-26 late 2020 in UK.

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Climate food for thought

- Climate Action Summit/Scientific Advisory Group:
  - Possibility to **engage also Ministers for Finance, Trade & Industry** in the COP process?
  - Possibility to offer **mitigation planning support** for UN Members?

- **Adaptation** is also important; e.g. investments in impact-based multi-hazard early warning services. The negative trend continues until 2060’s at least.

- Consumer interest growing: **carbon footprint of the goods**?

- **More than 5 % of global GDP is spent on fossil energy subsidies**; the climate problem could be solved with a fraction of that.

- African **population growth** a challenge for African countries & Europe

- **Political acceptance** of mitigation means is a challenge for most governments

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TEMPS CLIMAT EAU

Thank you
Gracias
Merci
Спасибо
谢谢

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World Meteorological Organization
Organisation météorologique mondi

Financial stability risks from climate change

Marja Nykänen
Deputy Governor
Bank of Finland
@MarjaNykanen

EU2019.FI

Greener
Finance for
Sustainable
Future

Problems in embedding climate risks into traditional financial risk framework

Greener Finance for Sustainable Future conference

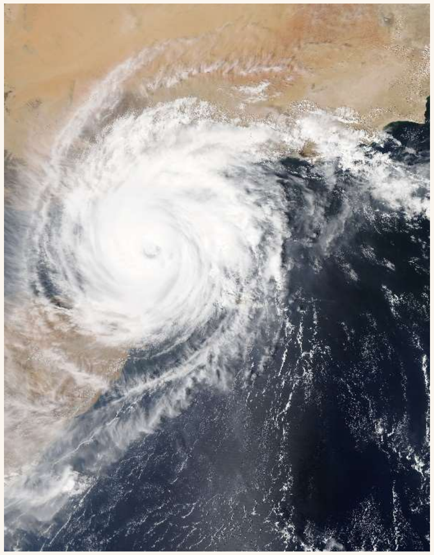
31 October 2019

Marja Nykänen
Bank of Finland


Photo: Unsplash

What types of risks does climate change pose to financial sector?

Physical risks

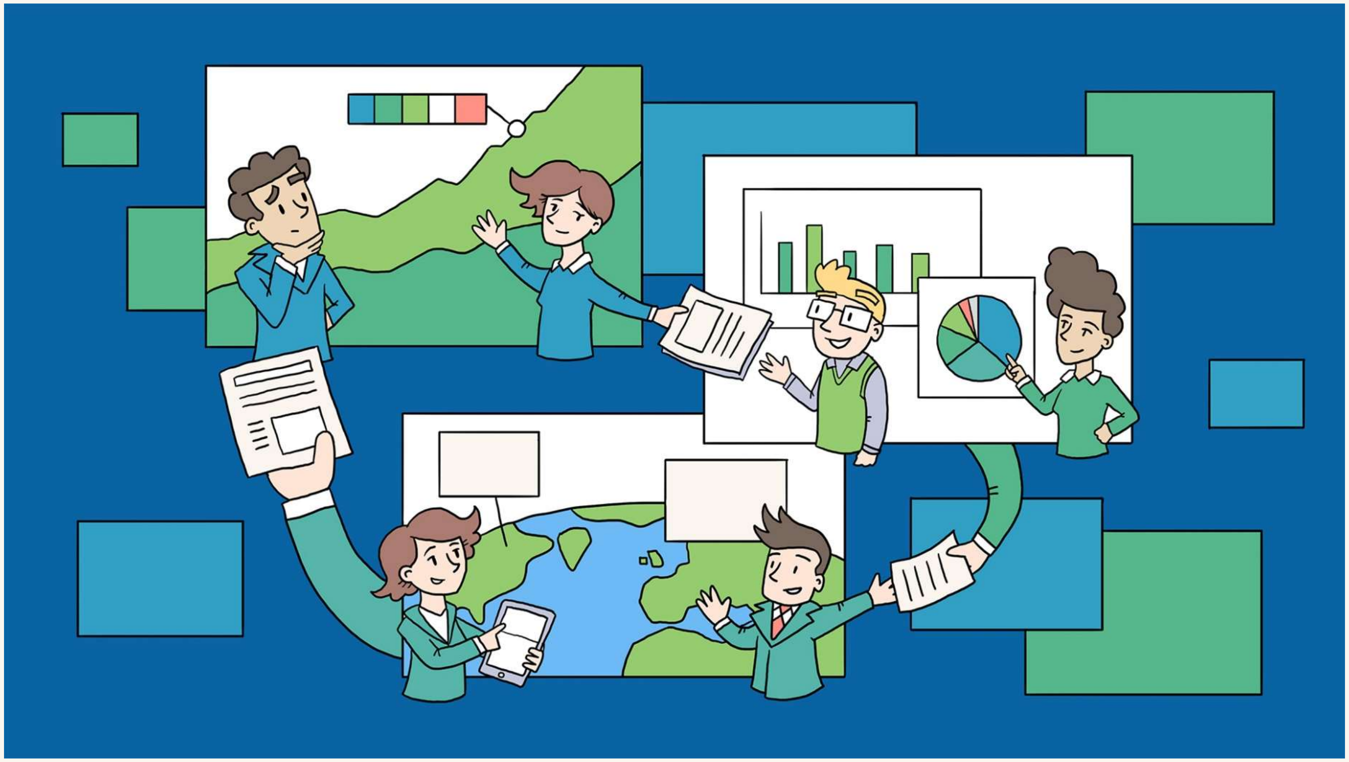


Transition risks

Photos: Unsplash

How should financial supervisors and regulators approach climate-based financial risks?

Climate risk analysis and modelling underlines the need for new data



SUOMEN PANKKI EUROJÄRJESTELMÄ FINLANDS BANK EUROSYSTEMET

What are the potential tools to incentivise sustainable investing?

Photo: Pixabay

Photo: Unsplash


Thank you!
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How can finance help combatting climate change?

Dirk Schoenmaker
Professor
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Greener Finance for **Sustainable Future**

EU2019.FI

Rotterdam School of Management
Erasmus University

Sustainable finance to fight climate change

Dirk Schoenmaker, Erasmus University Rotterdam & Bruegel

October 2019, Helsinki

Agenda

1. Why sustainable finance (investing and banking)?

2. Corporate objective: from shareholder (F) to stakeholder (F, S, E) model

3. Can investment approaches cope with broader perspective?
   - Neo-classical finance: only F dimension in market metrics
   - Answer: adding ESG factors to market metrics?

4. How to do it: new investment approaches
   - Need to analyse company’s business model to uncover S + E
   - Fundamental investing

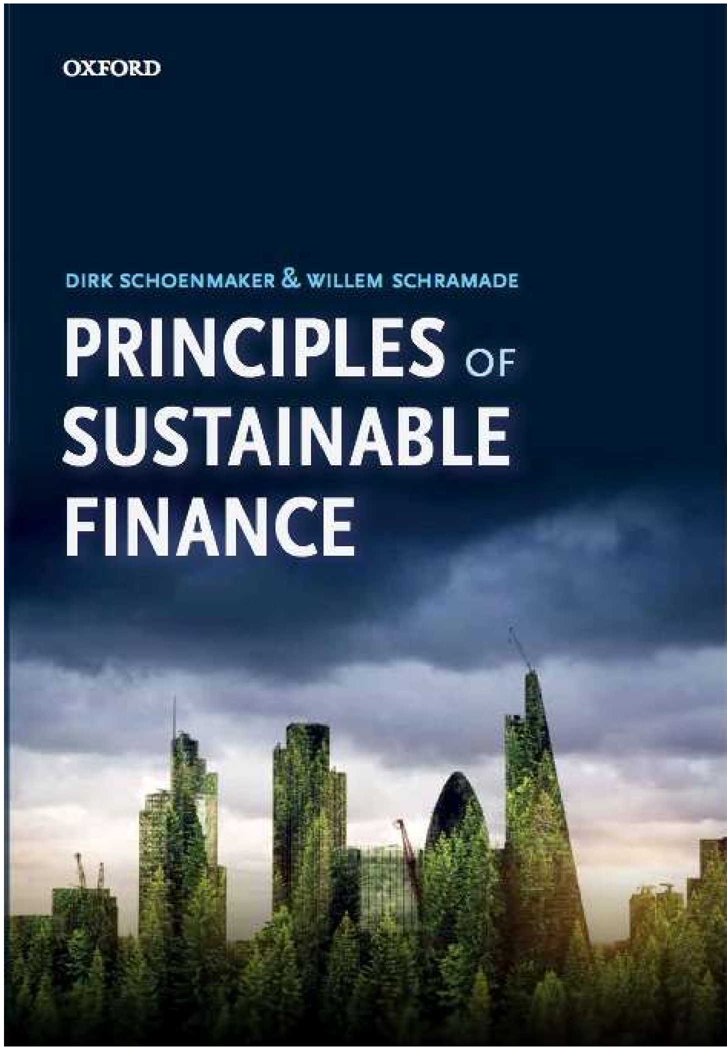
Based on book

Sustainability journey:

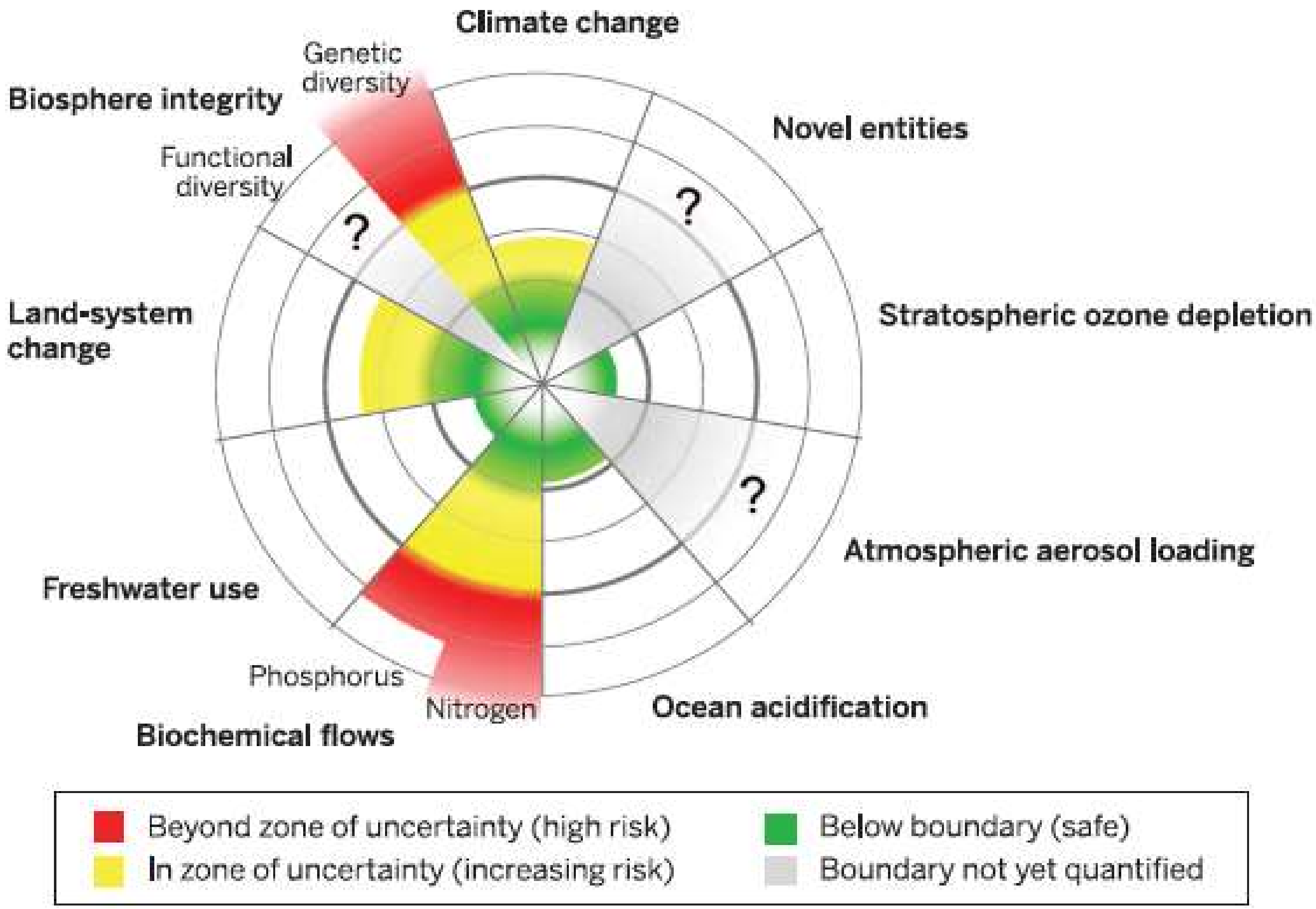
- Part 1) **why**: sustainability challenges
- Part 2) **what**: sustainable companies
- Part 3) **how**: financing of sustainable companies
- Part 4) **transition** to sustainable finance

Key message:

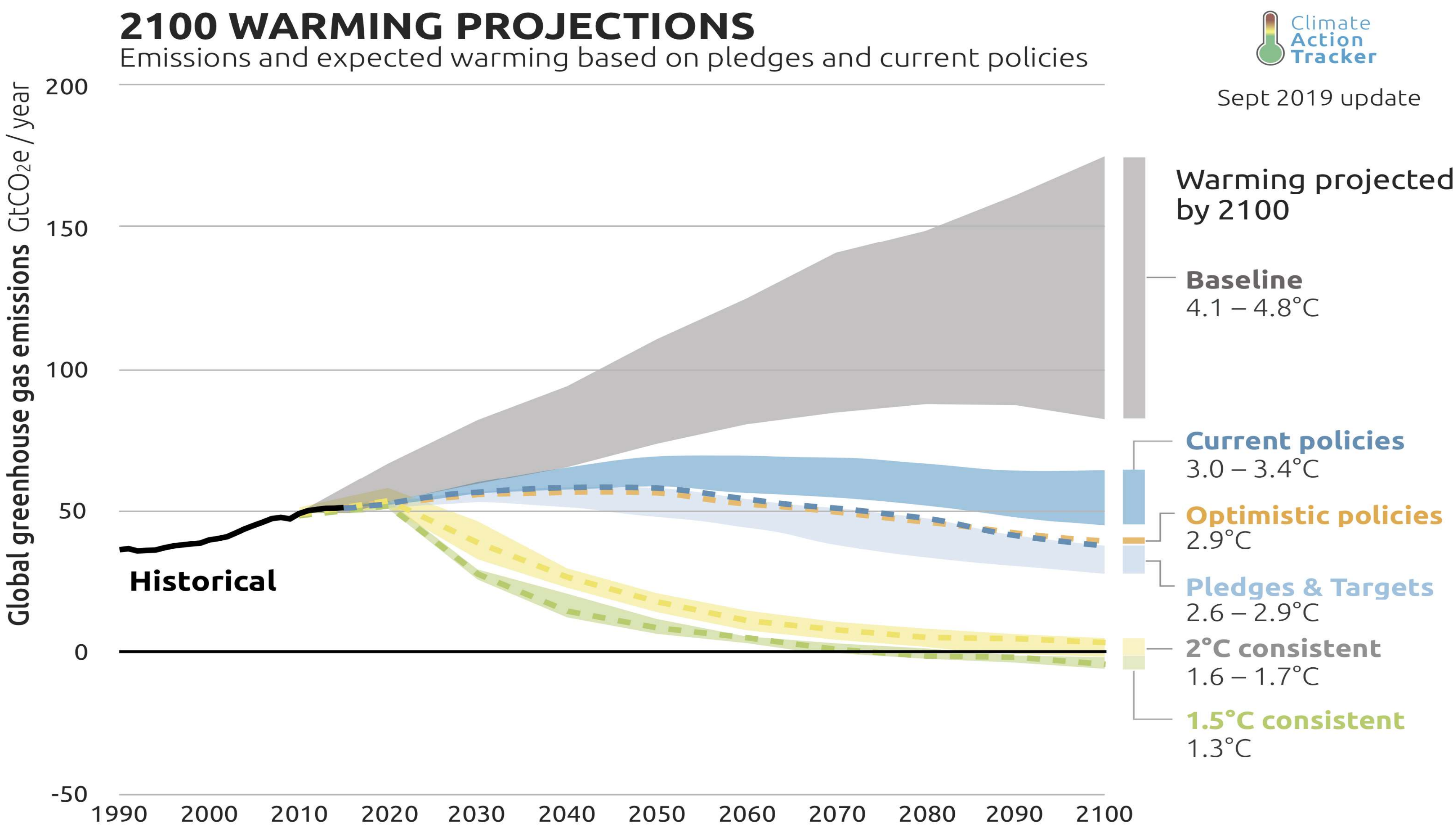
- From maximising profit **F**
- To maximising integrated value **I = F + S + E**



Planetary boundaries framework



Climate policy gap



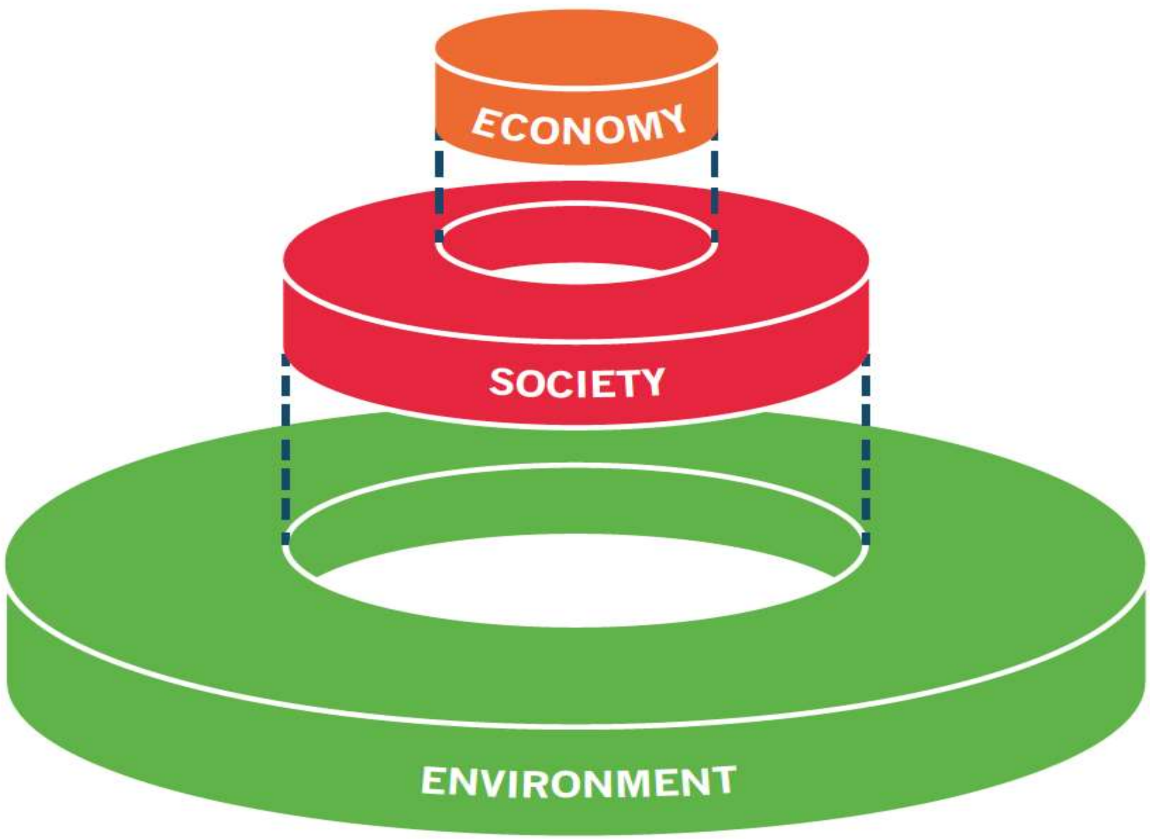
Social foundations

- Food security (no hunger)
- Adequate income (no poverty with income of less than $3.10 a day)
- Access to health care and water
- Access to energy and clean cooking facilities
- Education
- Decent work (living wage)
- Gender equality and social equity
- Political voice: right of people to be involved in decisions that affect them

Many people **live below** these social foundations

Global goals for sustainable development

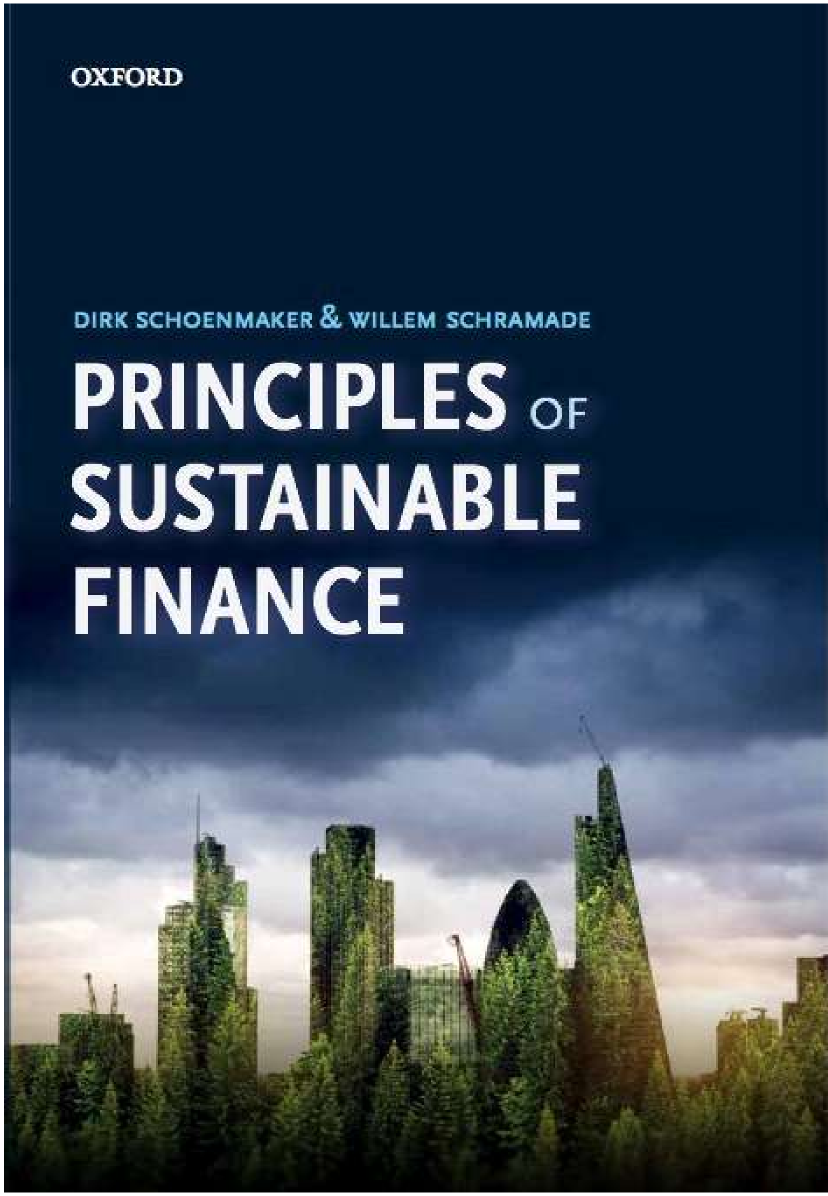
Managing sustainable development



- financial return and risk: **F**
- impact on society: **S**
- impact on environment: **E**

Principles of sustainable finance

Sustainable Finance Typology	Value created	Ranking of factors
Finance-as-usual	Shareholder value	F
Sustainable Finance 1.0	Refined shareholder value	F >> S and E
Sustainable Finance 2.0	Stakeholder value	I = F + S + E
Sustainable Finance 3.0	Common good value	S and E > F



Blind spots of the financial system

RSM Erasmus

Integrated value of tobacco companies:	Financial system only notices:
+ Profit	+ Profit
+ Employment	
- Premature death	
- Extra costs healthcare	
Net negative	**Net positive**

Why integrate sustainability?

Why would financials and corporates look at sustainability?

- Anticipation of regulation / taxation (e.g. carbon tax)
- Reputation – pressure from NGOs / consumers
- Future-proof: transition to SDGs by 2030
- Moral responsibility of financial and corporate managers

Transition

Main transitions

- ➢ Energy transition
- ➢ Circular economy
- ➢ Natural food/land restoration

Government policies may be fast or slow

- ➢ Transition is about true price and re-employment

Question for investors (and bankers)

- ➢ Are companies prepared for the transition?

How to do sustainable investing?

HLEG (2018): fiduciary duty of investors

- Yes, excellent to include sustainability in fiduciary duty

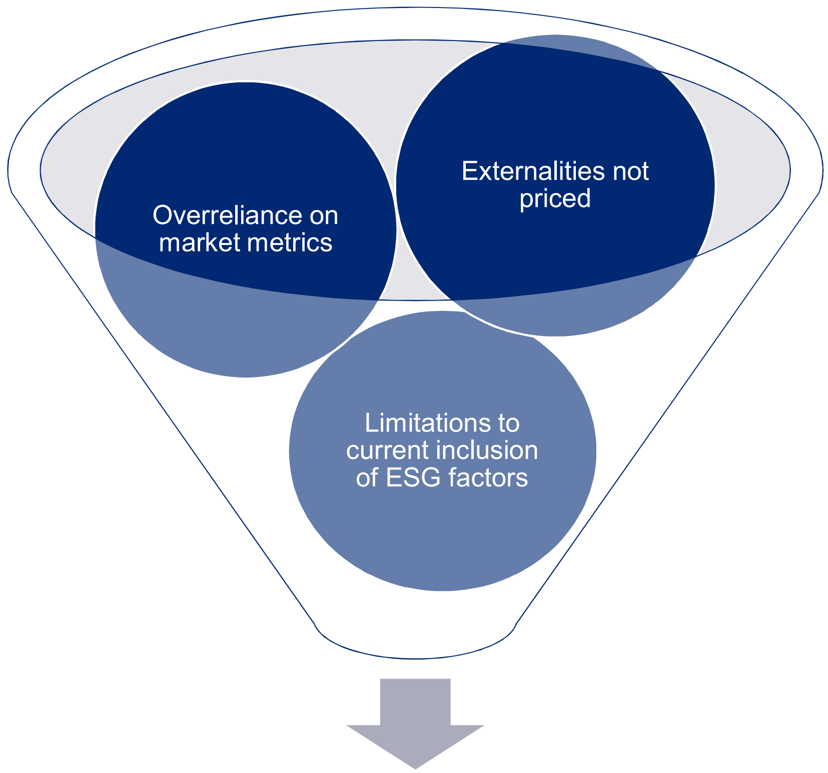
Who should be leading sustainable investments?

- HLEG (2018): taxonomy of sustainable investments – no, administrative approach by officials
- Our proposal (2019): market-led approach through fundamental investing

Traditional versus long-term investing

Dimension	Traditional investing	Long-term value creation
Typology	Sustainable Finance 1.0	Sustainable Finance 2.0
Market framework used	Efficient Markets Hypothesis	Adaptive Markets Hypothesis
Pricing of S and E dimension	Irrelevant or already priced in	Priced as market participants learn
Value maximisation	**Max F**	**Max I = F + S + E**
Value indicator	Earnings per Share (EPS)	Sophisticated DCF with scenarios for internalisation
Portfolios	Extremely diversified	More concentrated
Dialogues with corporates	Limited	Deep
Performance horizon	12 months	Years or decade

Current financial system fails to achieve societal goals



Social and environmental capital strongly undervalued

Overreliance on market metrics (F dimension)

Current investment practices have no role for E and S: unrealistic in a full world

Pricing	• EMH assumes all relevant info is priced • Implies passive investing
Allocation	• Modern portfolio theory / CAPM: risk is driven by volatility past stock returns • Implies diversification and passive investing
Performance measurement	• Benchmarking to a market index • Metrics driven by past risk/return characteristics

Limitations to approaches for inclusion of ESG factors

ESG tools:

- ESG ratings
- ESG indices

Problem 1: they are add-ons that do not address core issues

Problem 2: Design limitations

- Limited focus on materiality
- Based on reported data & policies only
- Industry neutral
- Focused on operations, not products

More problems:

- Bias to large companies
- Intuitively wrong scores
- Failure to spot material weaknesses

Solving it with an active investing approach

- Pricing: from EMH to AMH
- Allocation 1) from ESG factors to fundamental sustainability analysis
- Allocation 2) from extremely diversified to more concentrated portfolios
- Engagement
- Alternative measures of performance

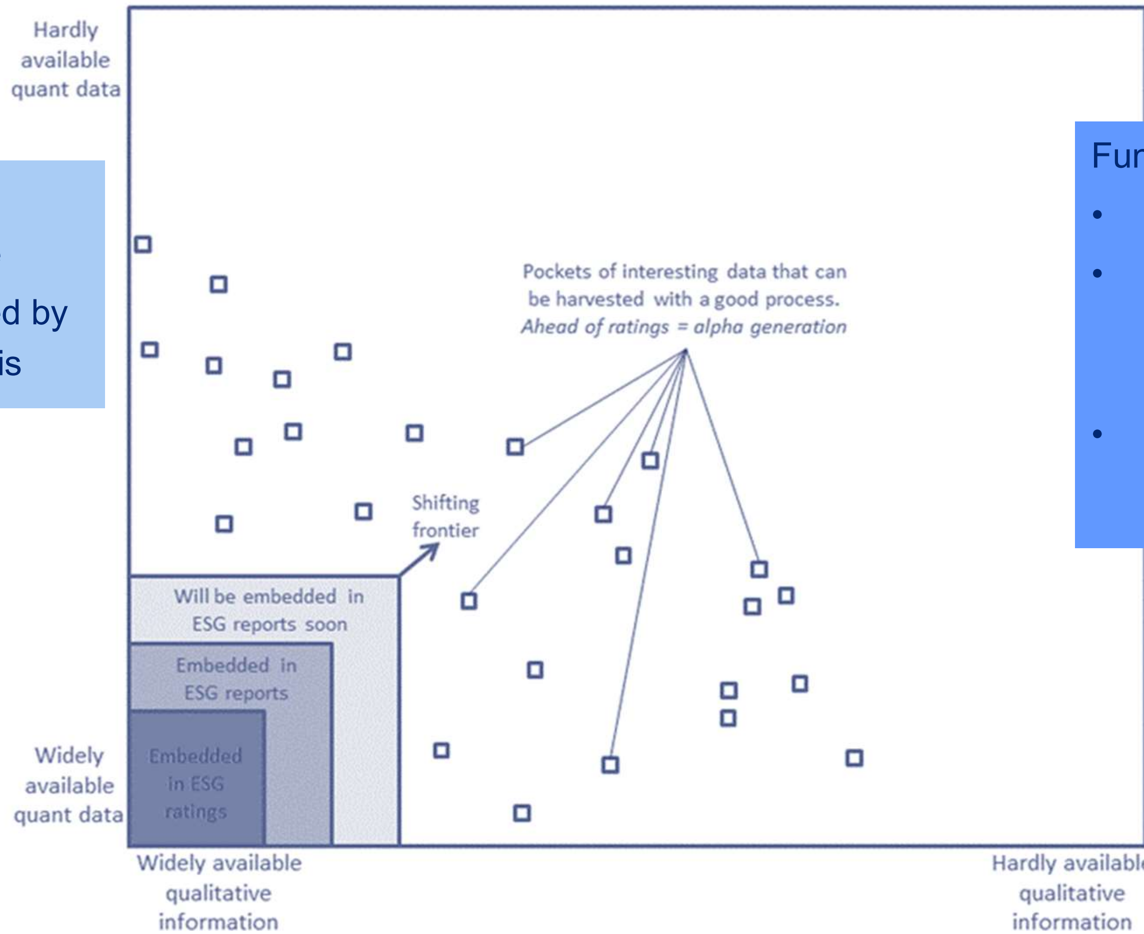
Pricing: from EMH to AMH

EMH	AMH
Instantaneous incorporation of all relevant information	Degree of market efficiency depends on market ecology
All ESG information is either irrelevant or already priced	Pricing of ESG information depends on the number and quality of market participants that take ESG seriously
Unrealistic	Plausible

Allocation 1) from ESG factors to fundamental ESG analysis

ESG factors

- should improve over time
- Need to be complemented by fundamental ESG analysis



Fundamental ESG analysis:

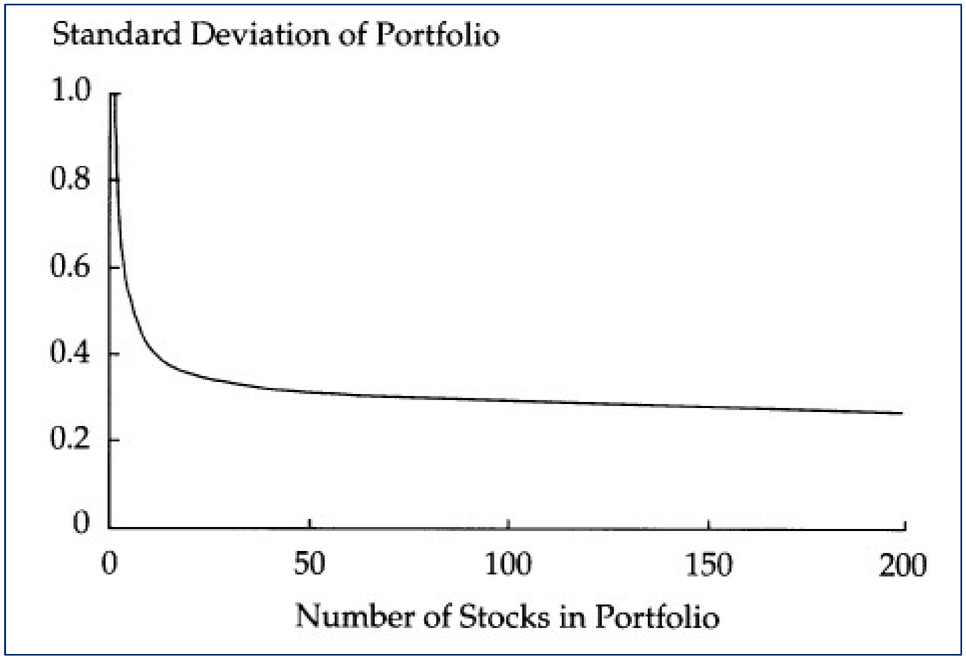
- Materiality assessment
- Hit investment process in all stages – including valuation
- Challenges: mindsets and data – see chapter 8

Allocation 2) from diversified to concentrated portfolios

Pension funds may hold thousands of different securities

Serious engagement not feasible…

… while not necessary from a diversification perspective….



Engagement

Investors and corporates to exchange funds & ideas:

- Pressure to end unsustainable practices
- Improve reporting
- Share best practices

Engagement is costly:

- Time intense
- Requires deep knowledge, patience & coordination

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Engagement in practice:

- Not feasible for large portfolios
- Shallow (disconnected from investment case) and/or narrow: voting, not dialogue

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Ideally:

- Integrated process from analysis and selection to engagement
- Integrated teams for portfolio management and engagement

Performance measurement

Companies:

- Financial reports

Investors:

- Benchmarking performance to market index (relative returns)

Sustainability

- ESG ratings

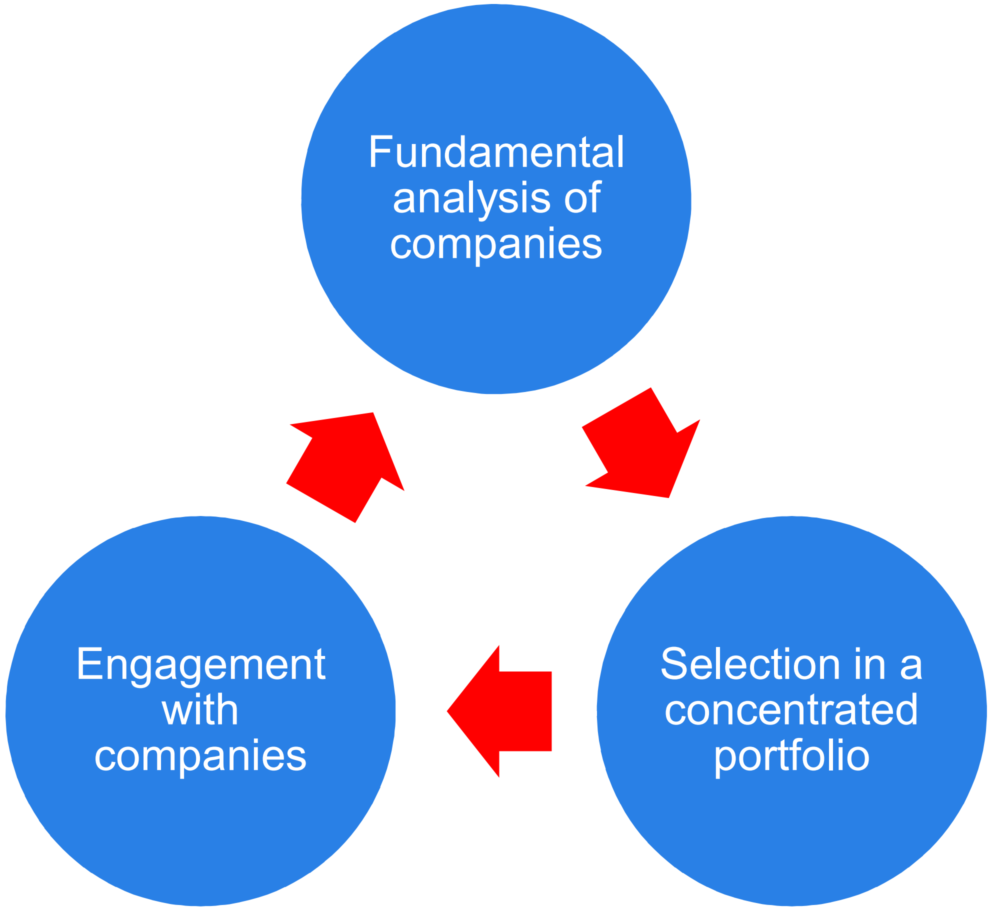
Investors:

- From ESG (input) to SDGs (output: impact)
- Absolute returns

Companies:

- Integrated reporting is slowly emerging
- Examples:
  - Philips Annual Report
  - ABN AMRO Impact Statement

Virtuous cycle of sustainable investing



Conclusions

Long-term value creation to achieve SDGs

- From narrow F dimension
- To integrated value: I = F + S + E

Finance is about anticipating events and pricing them in today

- Finance contributes to swift(er) transition
- Need for LT patient capital