

Challenges facing policy makers, what is happening in the EU?

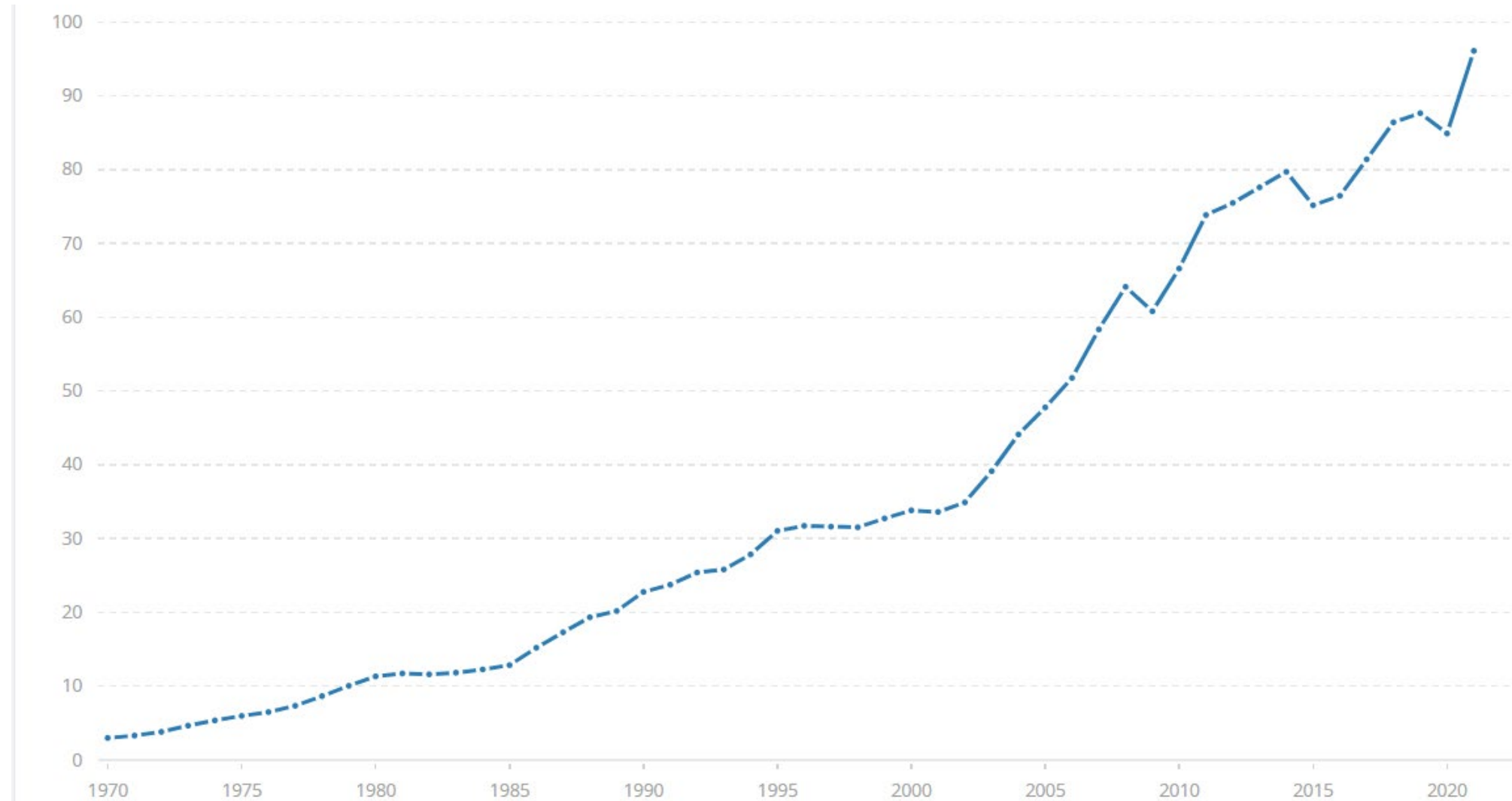
IEA 4E SSL Seminar 2023-03-27

Peter Bennich

The Swedish Energy Agency

Background

GDB 1970 – 2021 [Relative scale]



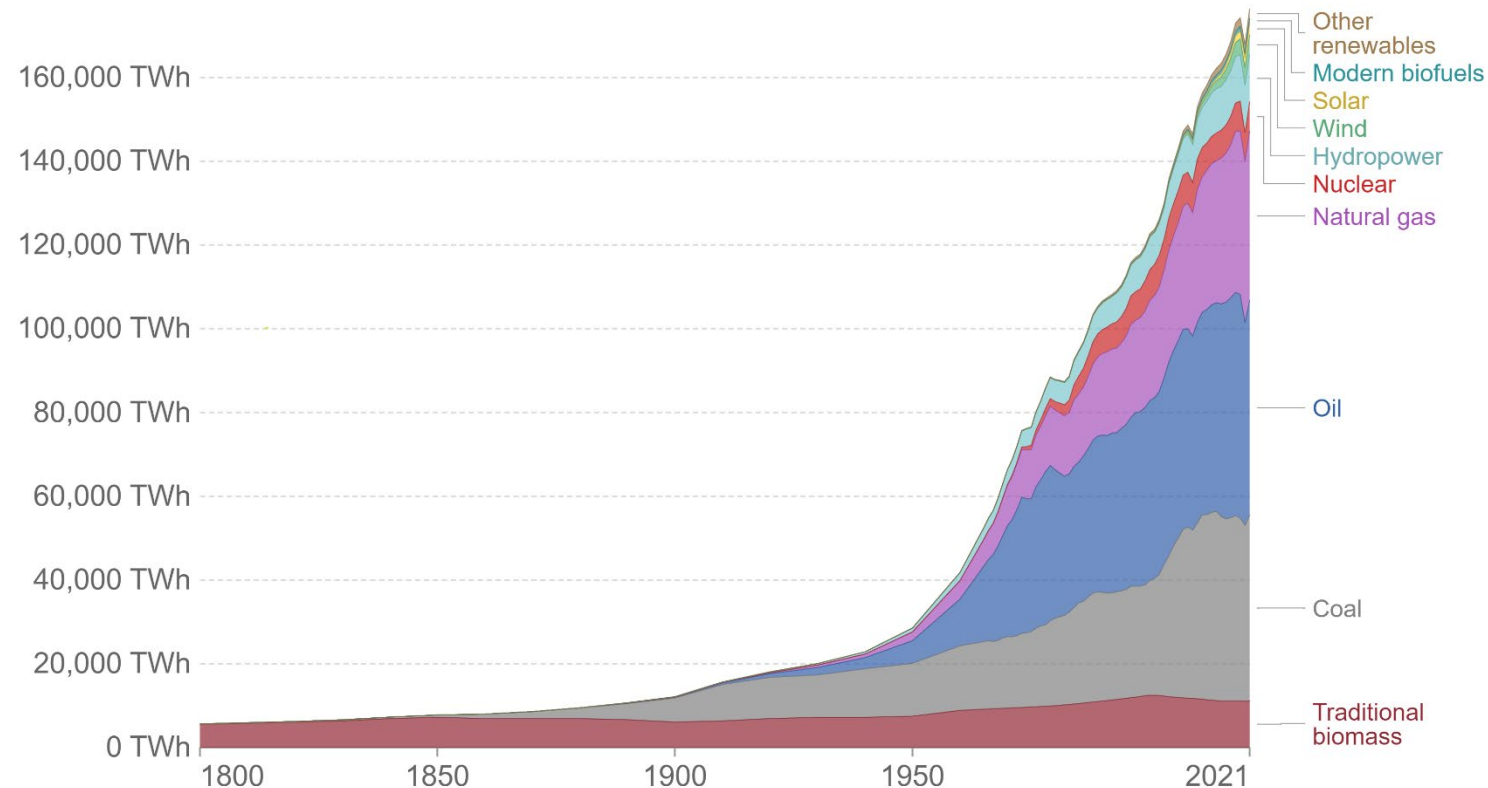
Global energy mix 1800 – 2021

From 1950: *The great acceleration*

Global primary energy consumption by source

Primary energy is calculated based on the 'substitution method' which takes account of the inefficiencies in fossil fuel production by converting non-fossil energy into the energy inputs required if they had the same conversion losses as fossil fuels.

Our World
in Data

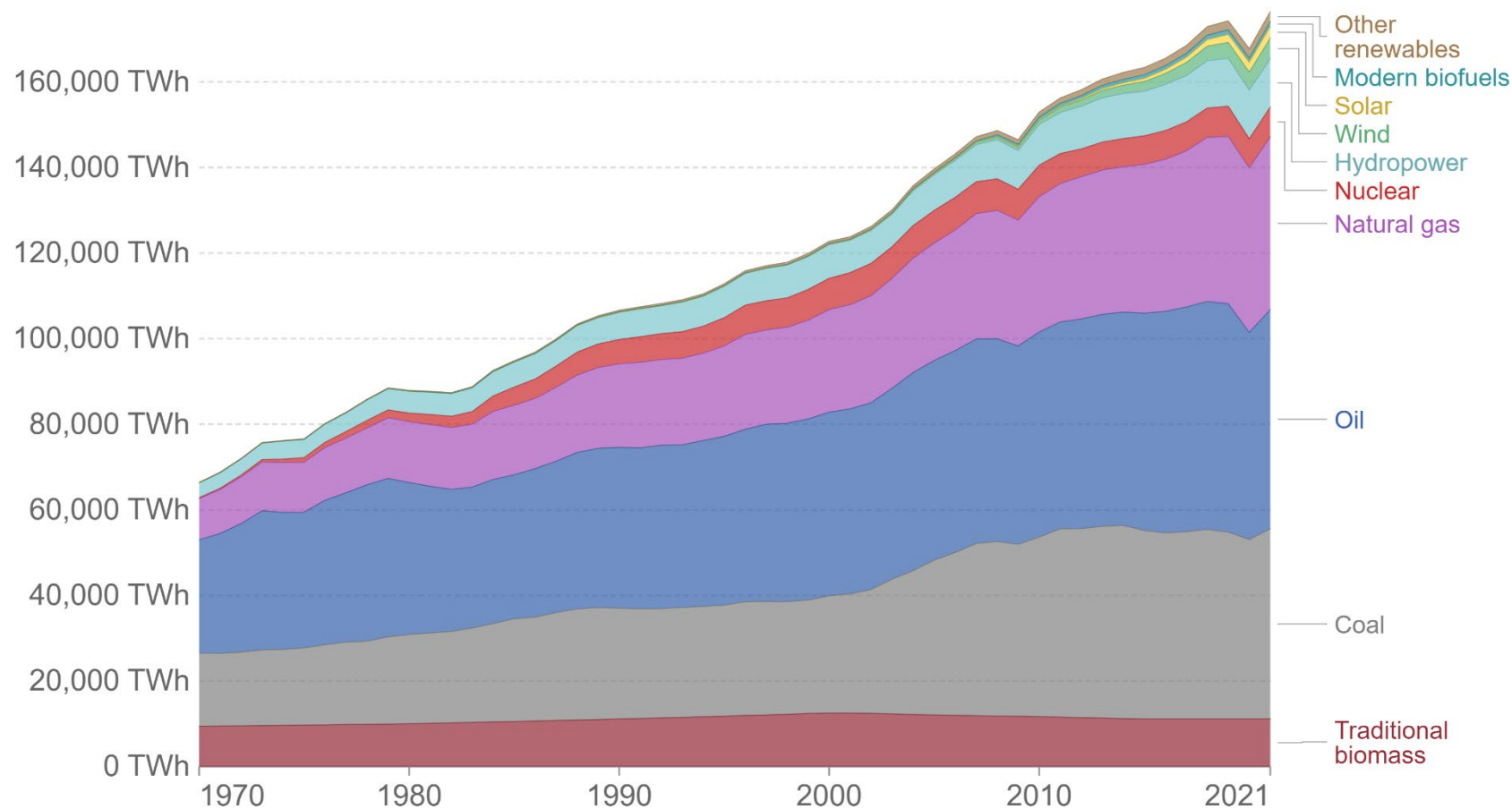


Global energy mix 1970 - 2021

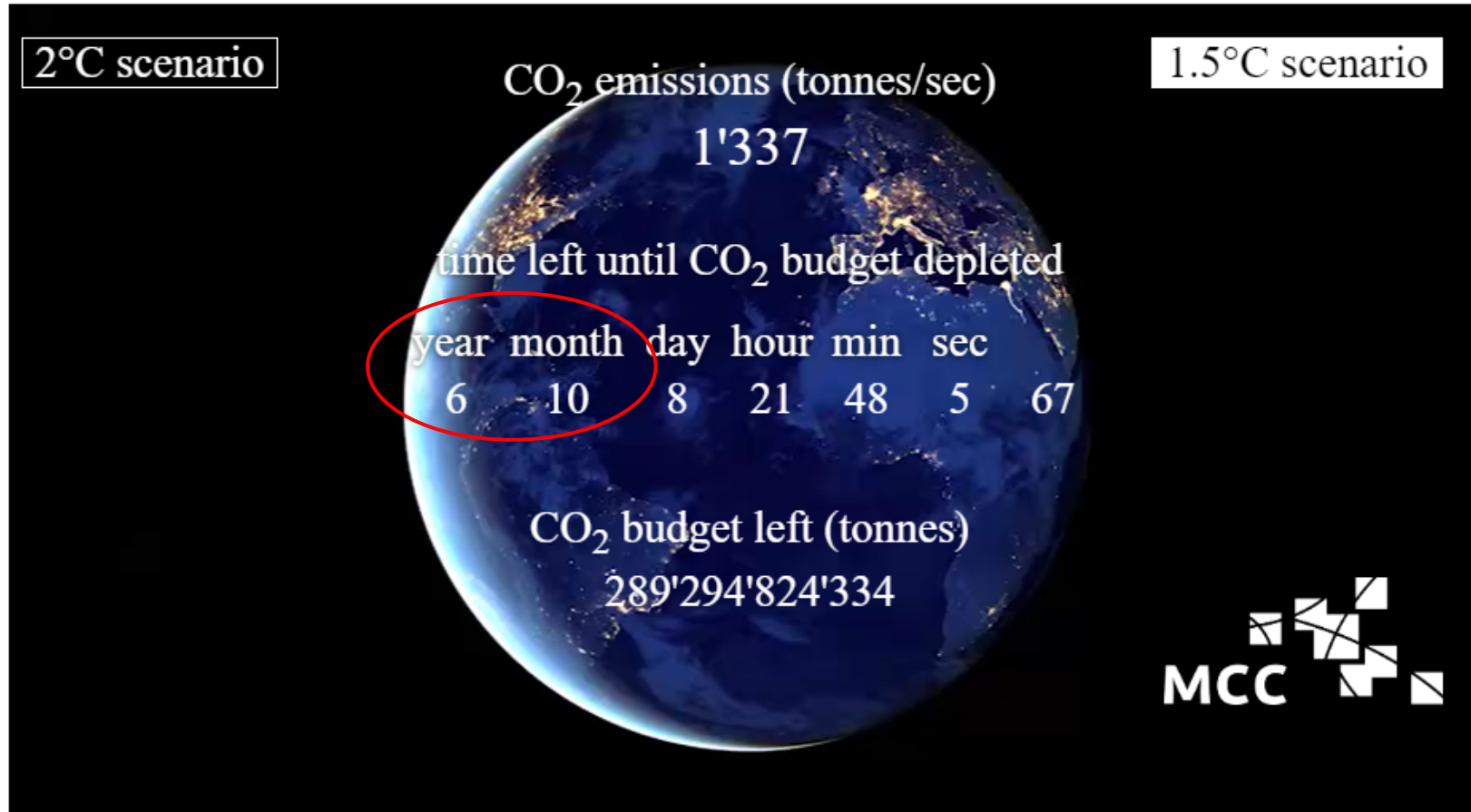
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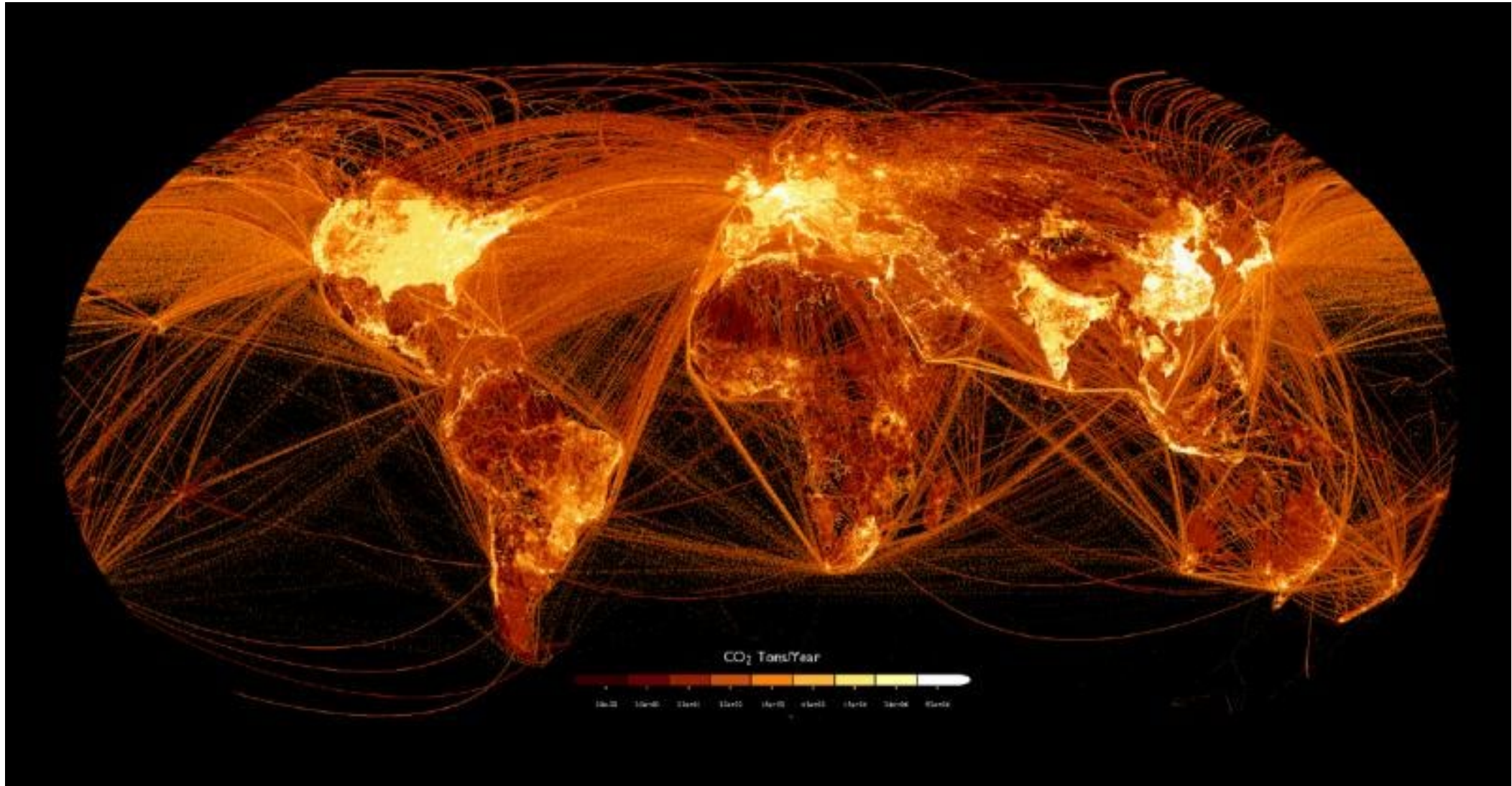


The CO₂-budget is shrinking *fast*



Harsh message: Only 289 Gt CO₂ left in the budget, emissions ca 42 GtCO₂/yr -> ca **7 years left with the current emission rate...**
36 ton/capita!

The emissions are extremely unequally distributed



<https://www.visualcapitalist.com/cp/mapped-carbon-dioxide-emissions-around-the-world/>

The IPCC Assessment report nr 6 (AR6)

AR6 Synthesis Report: Climate Change 2023

REPORT

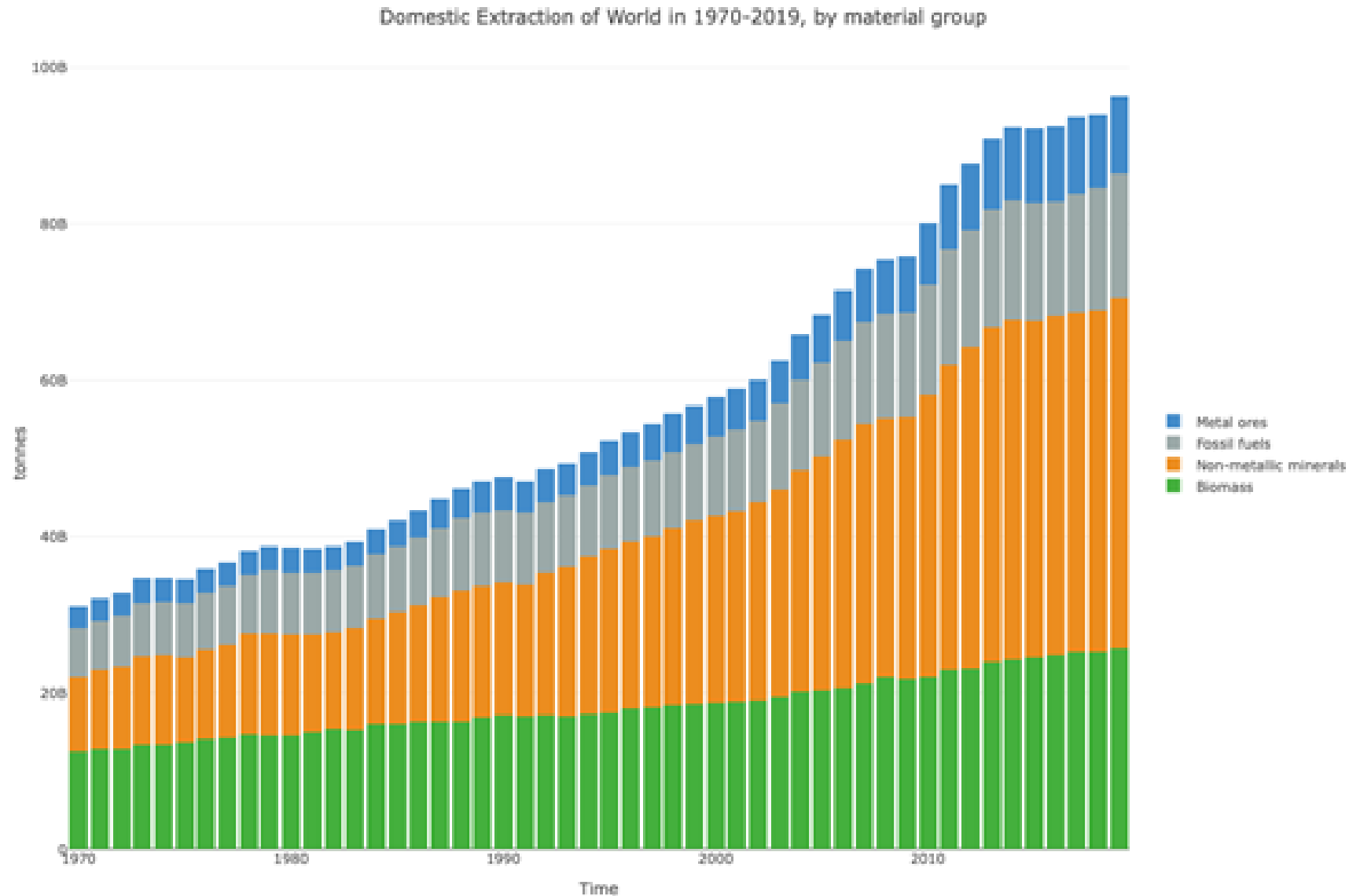
The IPCC finalized the Synthesis Report for the Sixth Assessment Report during the Panel's 58th Session held in Interlaken, Switzerland from 13 - 19 March 2023.

READ THE REPORT

CORE WRITING TEAM

[AR6 Synthesis Report: Climate Change 2023 — IPCC](#)

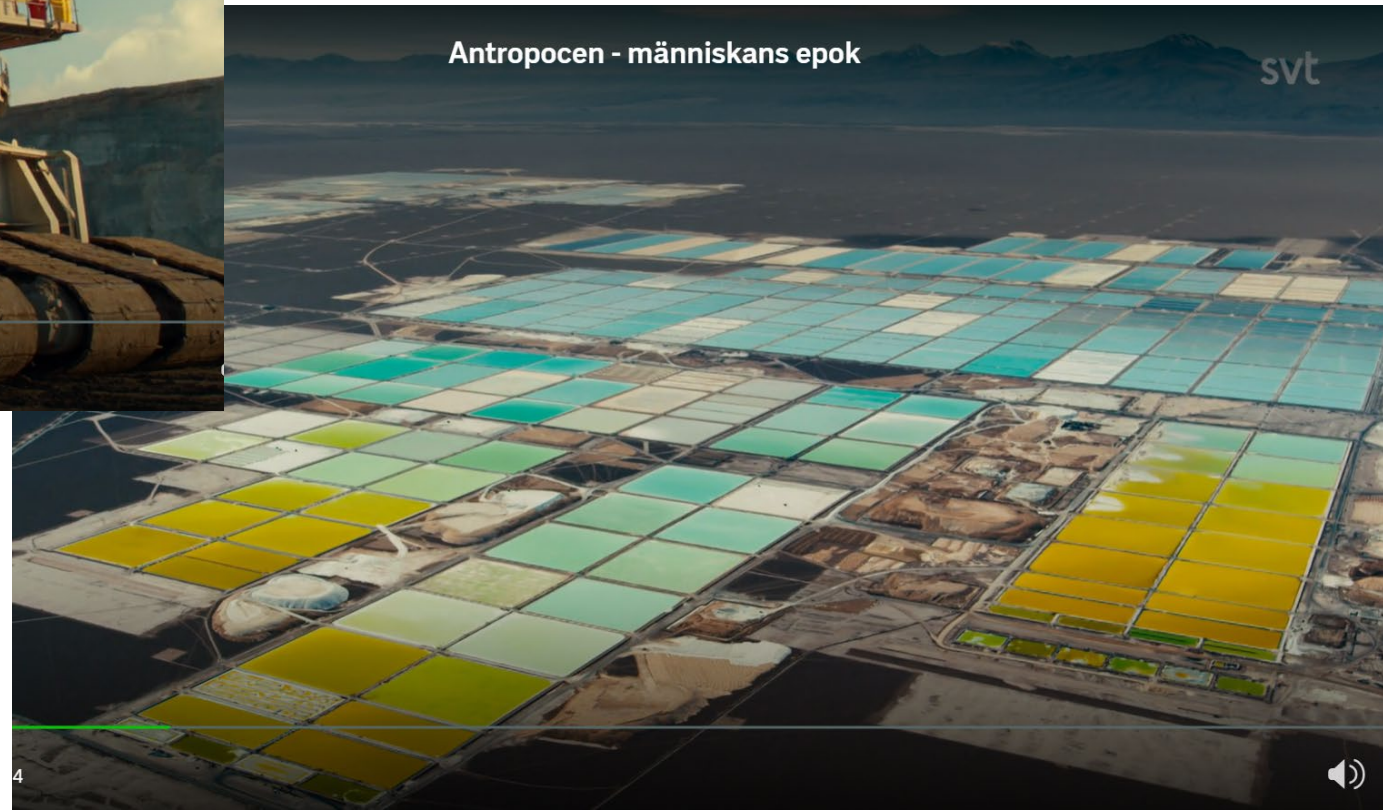
Material use 1970-2019



Pictures from "Antropocen" (2018)

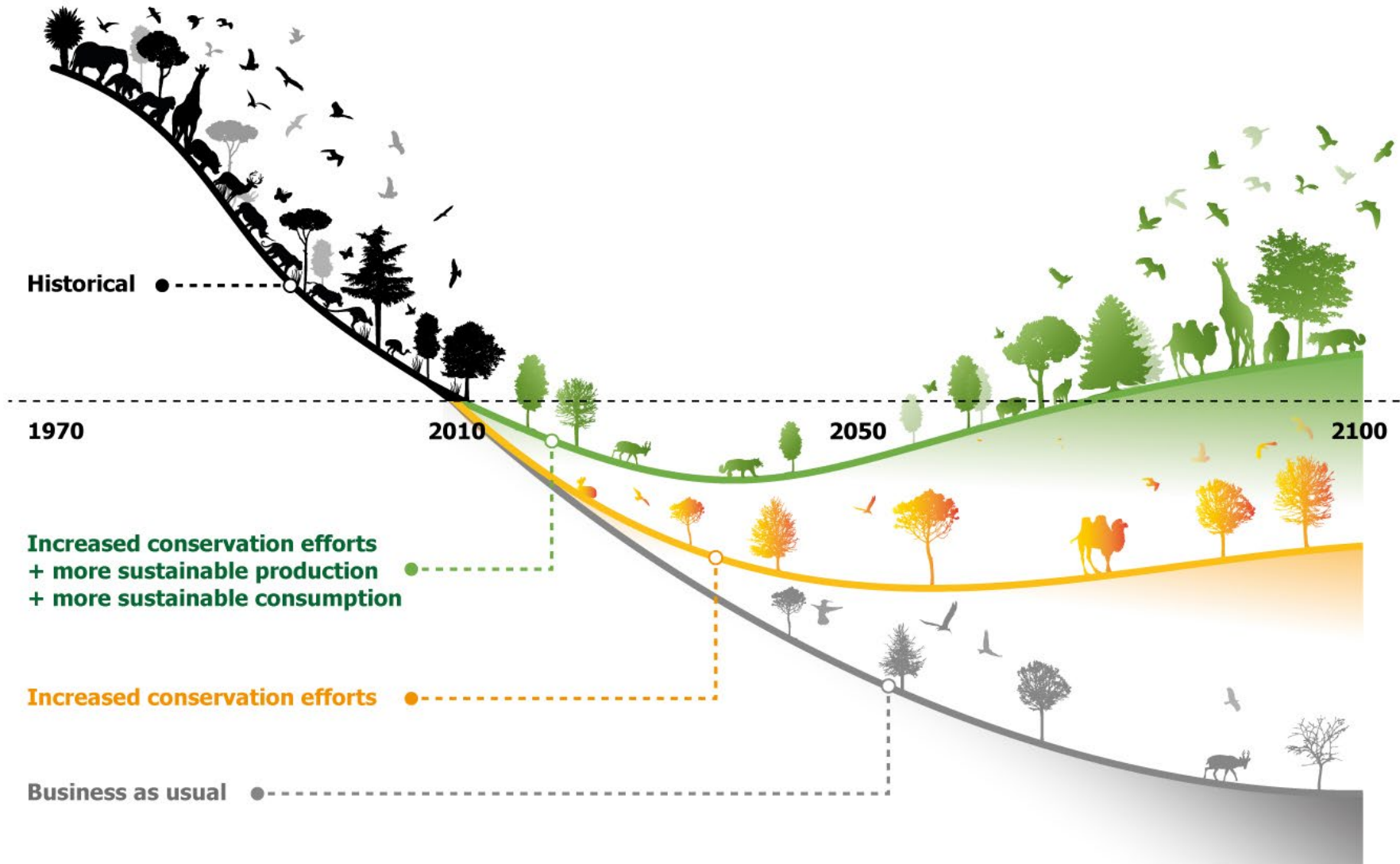


Big Digger, digging for coal



Salines in Chile – lithium production

Loss of biodiversity increases as well: The 6th mass extinction



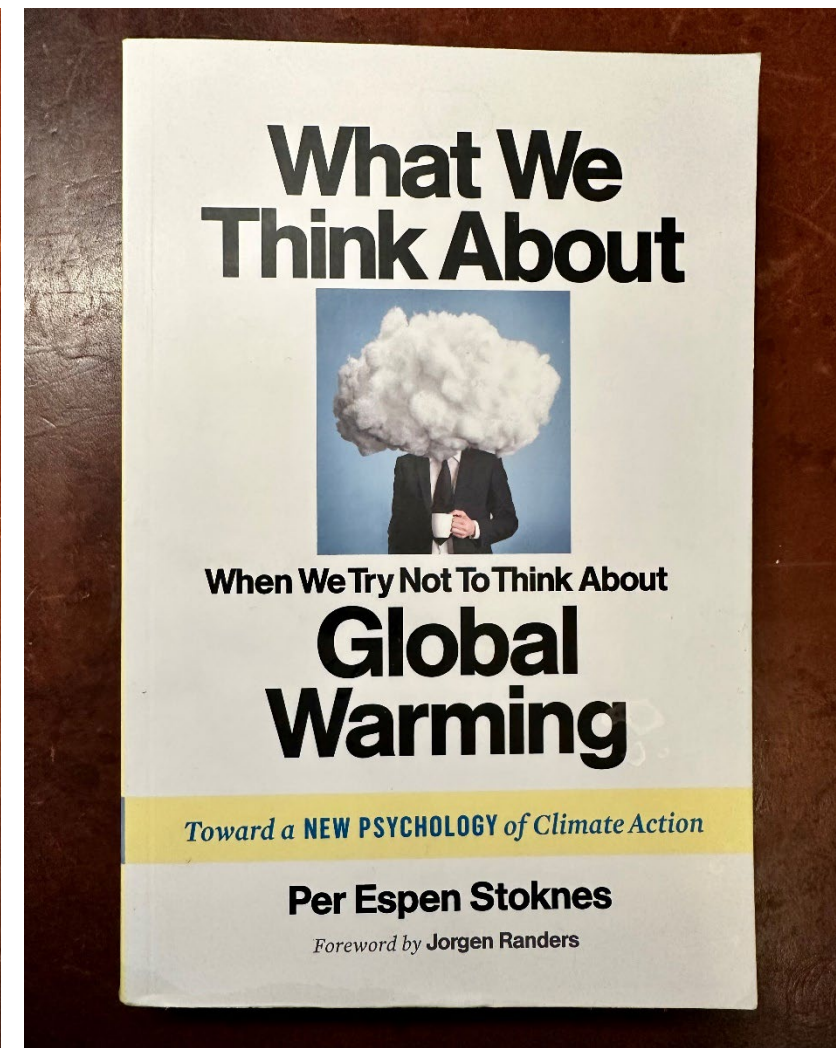
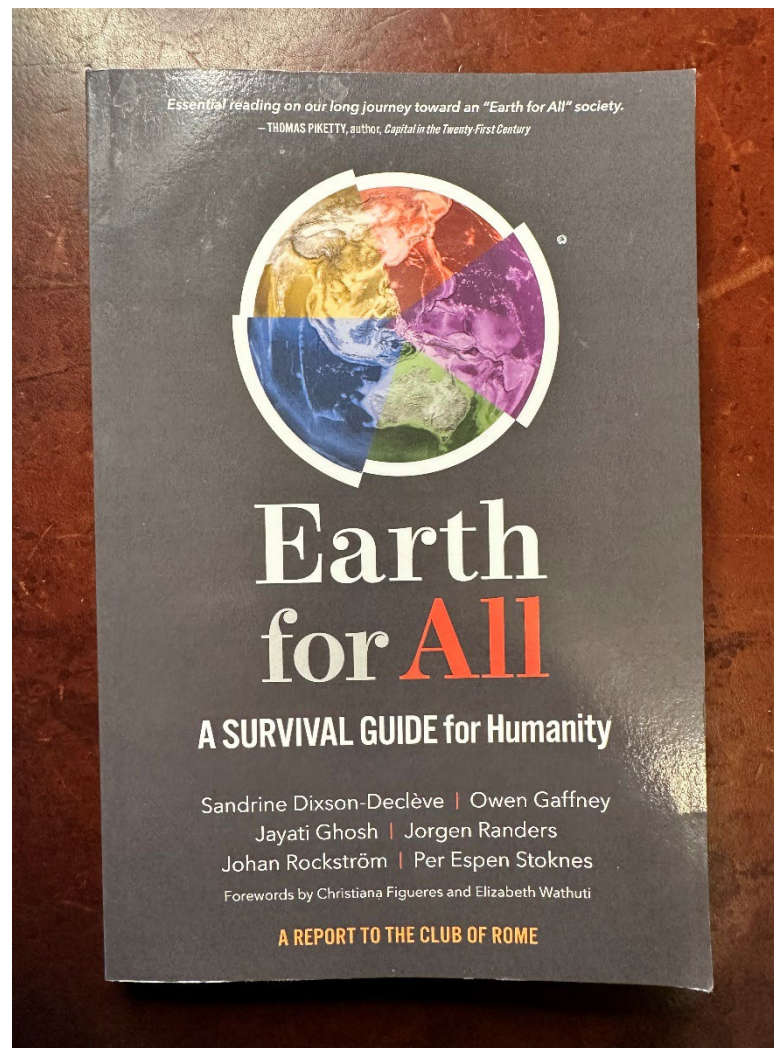
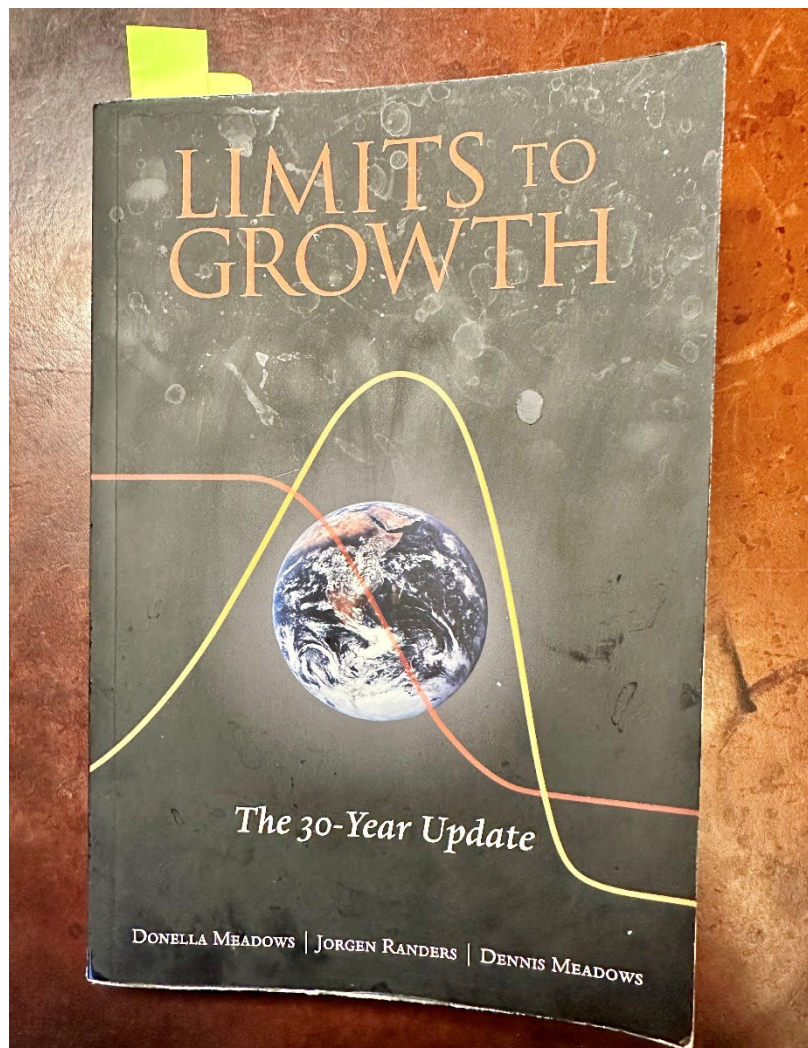
Observations

1. The GDP, use of energy, particularly fossil energy, *and* the material use, all *correlate* with each other
2. All curves gets steeper *upwards* after the millenium shift
3. Renewable energy has only been *added* to the energy mix, not *substituting* any fossil energy
4. On the contrary, today we are using *more* fossil energy than ever, and hence have *record high* emissions... ca 42 GtCO₂/yr

Critical questions

1. Is it *really* possible to achieve *de-coupling* between GDP-growth and the use of energy and material (often forgotten)? – The whole question of (physical) Limits to (economic) Growth (L2G)
 - If yes: how fast can it go, given the remaining CO₂-budget?
 - If no: what to do... but to decrease the consumption dramatically?
2. EU: Assumes decoupling *is* possible
3. Regardless: we need to understand our own psychology better, to ensure a positive perception of a transition to a sustainable society

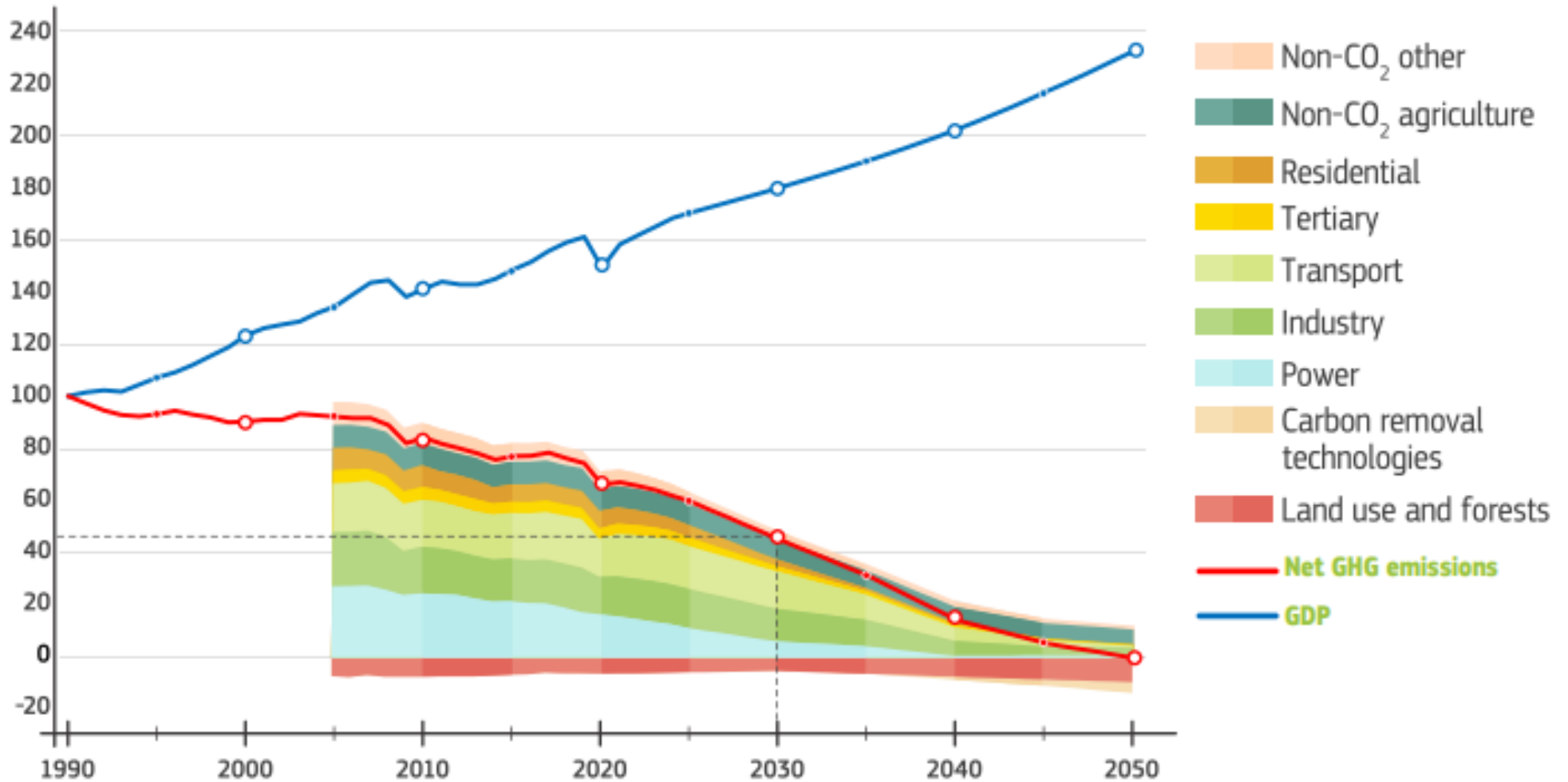
Suggested readings to understand more



The response in EU:
Reduce CO₂-emissions by 55 % to 2030
The Fit for 55 package

Action is needed in *all* sectors to achieve decoupling

Europe has a strong track record of **cutting emissions whilst growing its economy**. Achieving our new target of 55% greenhouse gas emissions by 2030 will require action across all sectors.



... which requires a *broad* set of policies



EU Emissions Trading System (ETS)

- A strengthened cap on overall emissions under the EU ETS
- Aim to expand the use of emission trading to the maritime, buildings and road transport sectors
- Look into the integration of all emissions from fossil fuel combustion



Energy Efficiency

- Review the current EU energy efficiency target of 32.5% by 2030
- Launch a renovation wave to improve housing quality in the EU
- Strengthen the role of Eco-design standards to ensure EU consumers have access to efficient products



Renewable Energy

- Review the current target of 32% of renewables in the EU energy mix by 2030
- Review and revisit the biomass sustainability criteria
- New European terminology and certification system for all renewable and low-carbon fuels



Road transport CO₂ emissions

- Revisit and strengthen the CO₂ standards for cars and vans for 2030 and beyond
- Reflection on phase-out target date for internal combustion engines



Agriculture, Land Use, Land Use Change and Forestry (LULUCF)

- Integrated approach to reduce emissions from agriculture, provide bio-based materials for our economy, protect and enhance the natural carbon sink and improve the resilience of the EU's forests and agriculture to climate change

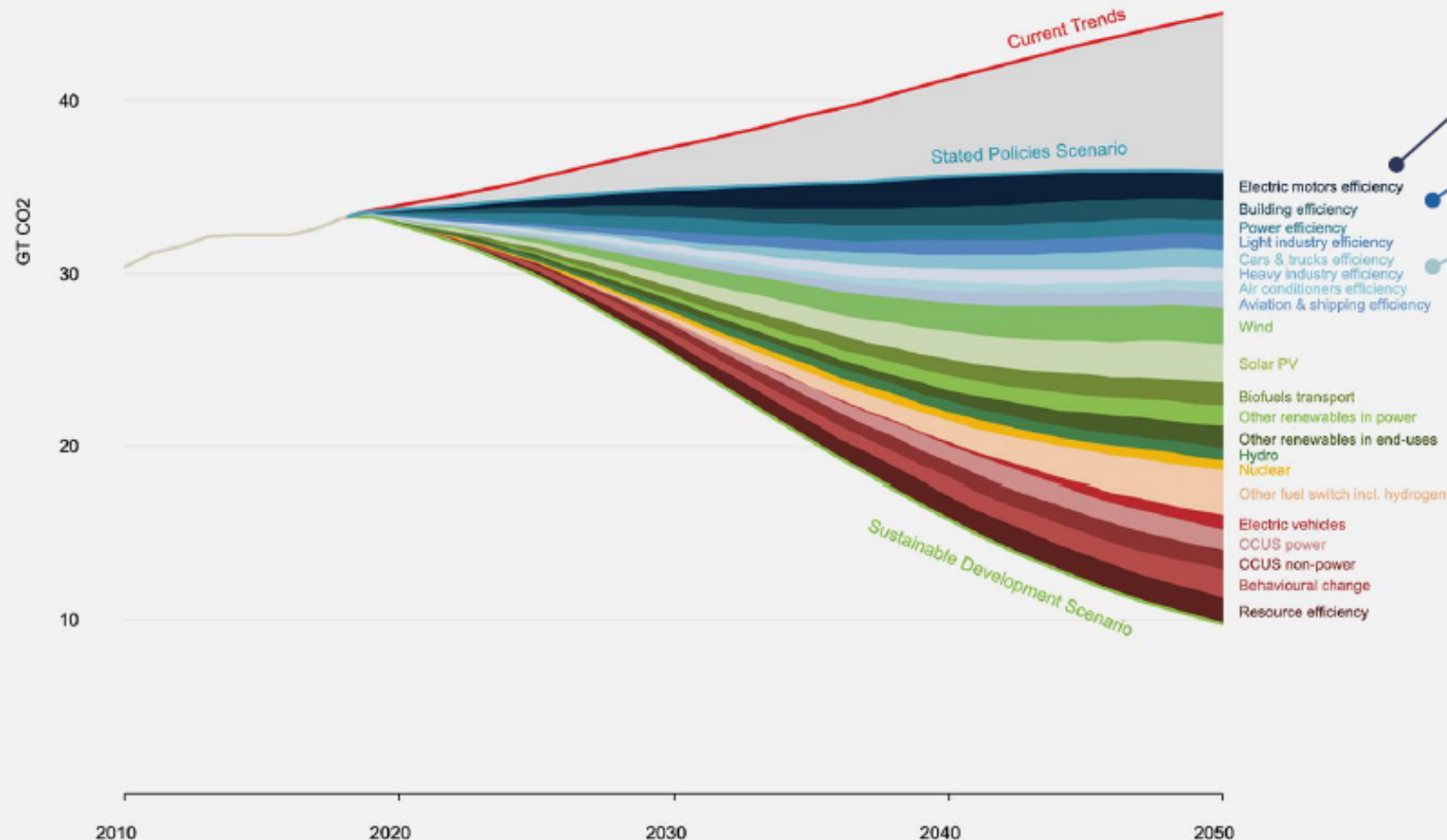


Effort Sharing

- Options range from reduced scope to potential future repeal if all emissions are covered by other policy instruments, while taking into account distributional concerns between Member States

Product efficiency plays a key role in ensuring a 1.5-2°C pathway, accounting for more than a third of current global electricity consumption

Energy-related CO₂ emissions and reductions by source



Which ones are key for this initiative?

Electric motors efficiency

Building efficiency,
incl. lighting
and refrigeration

Air conditioners efficiency

Industrial electric motors, along with residential lighting, cooling and refrigeration are responsible for more than **a third of current global electricity consumption**.

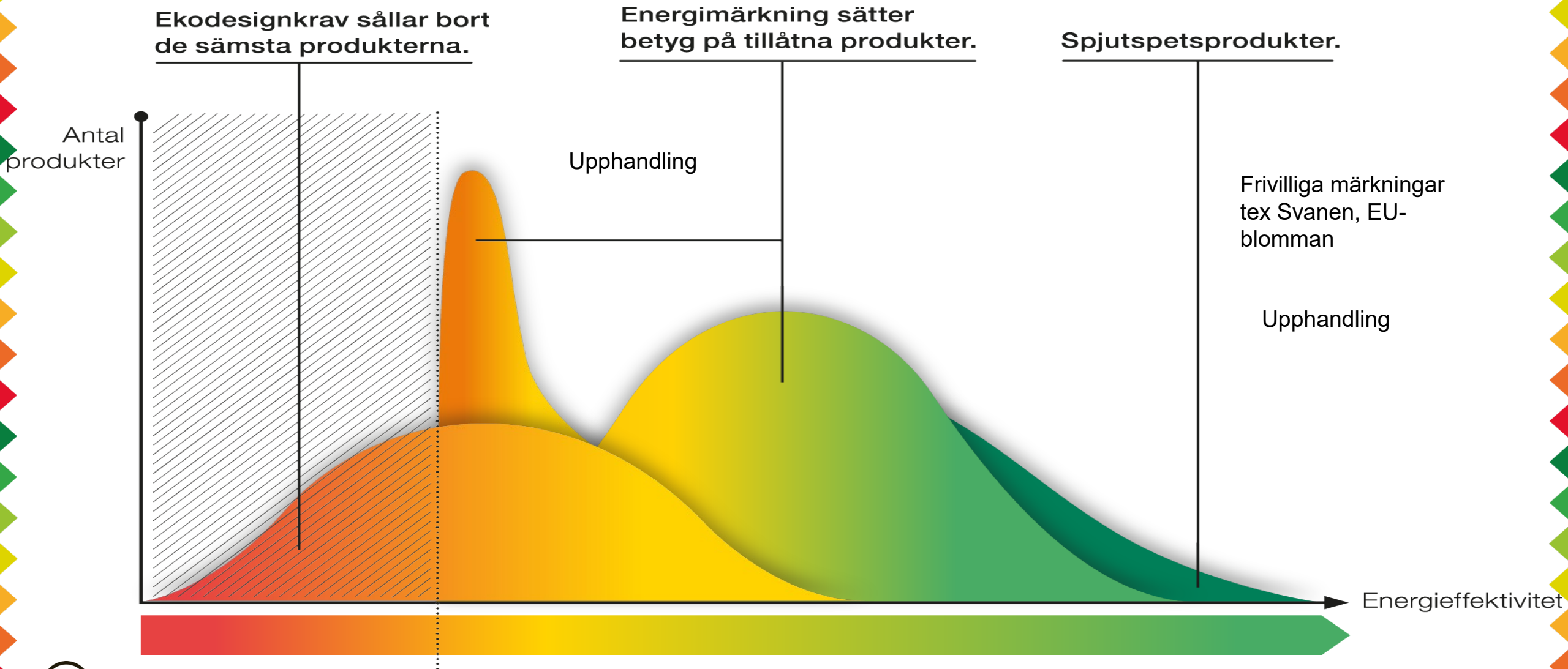
UNEP Emissions Gap Report (2017) notes that efficient appliances is one of the six areas with **highest potential of closing emissions gap to Paris**.

Therefore, improving energy efficiency for these products is a key source of emissions reductions to achieve the Paris targets.

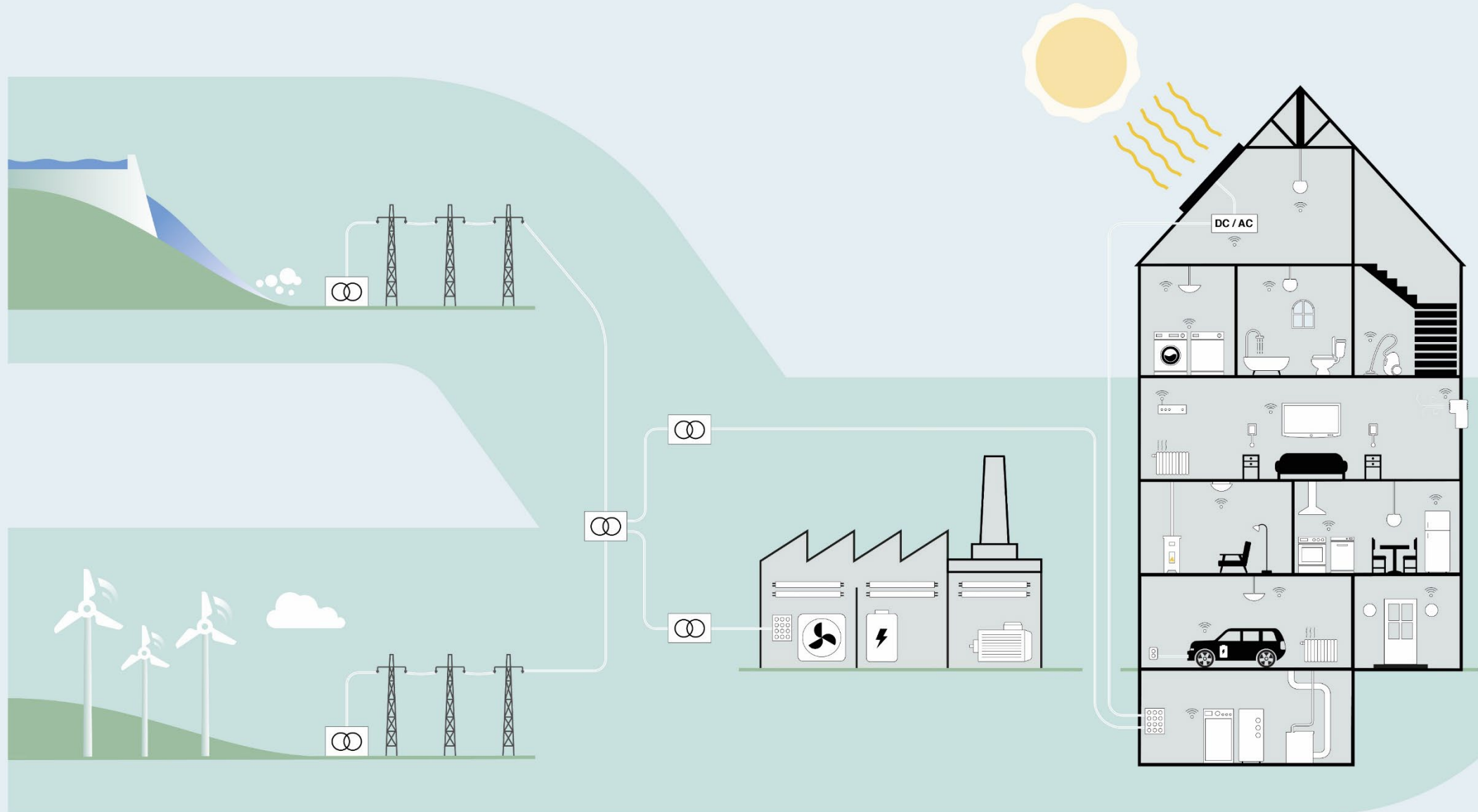
Ecodesign and energy labelling

- The main policy tools to achieve energy efficient products

Ecodesign is a process that drives innovation



Ca 30 products are regulated by ecodesign and/or energy labelling

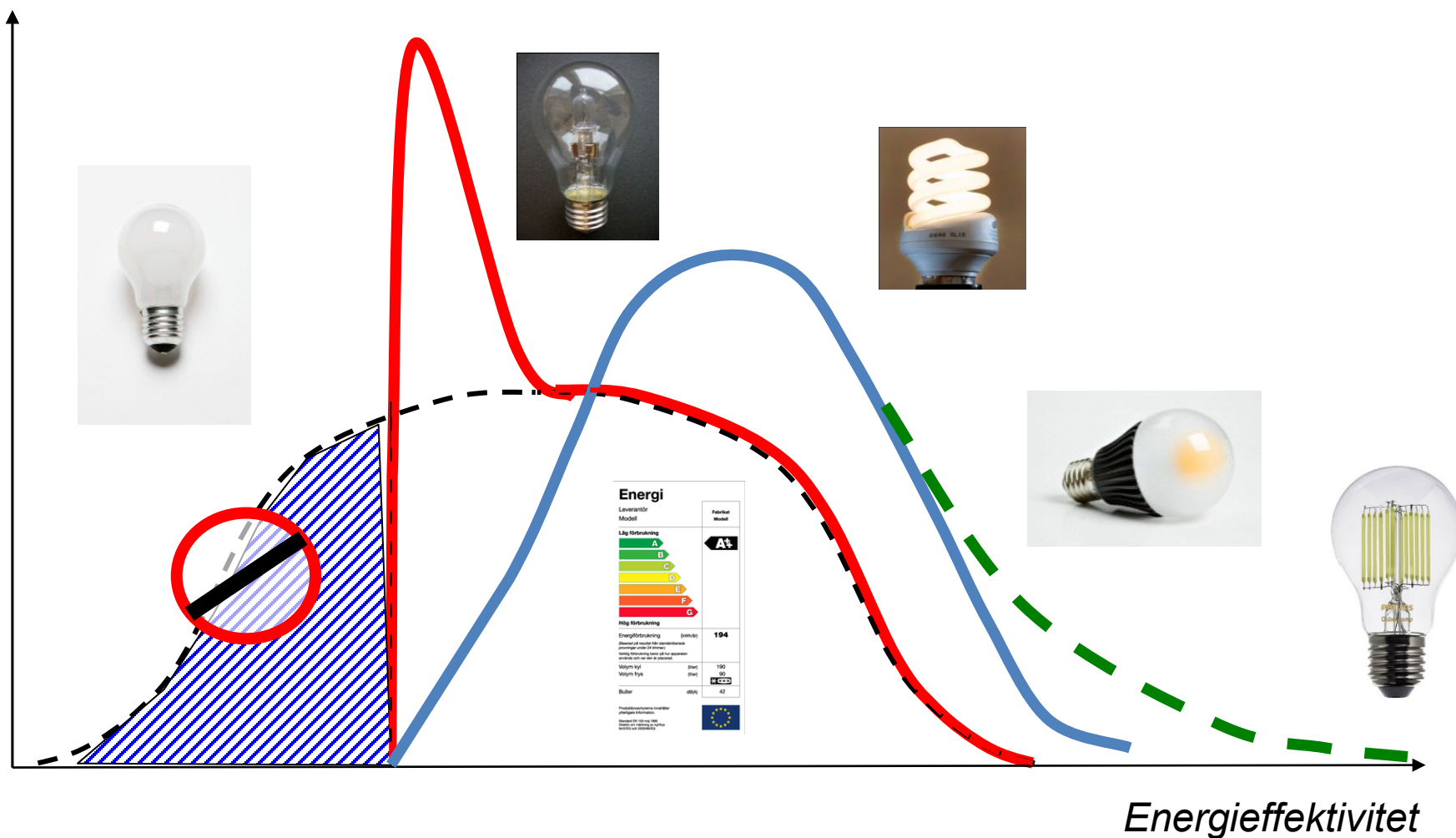


Example: Lighting – snapshot from 2012

Ekodesign

Energimärkning

Grön upphandling

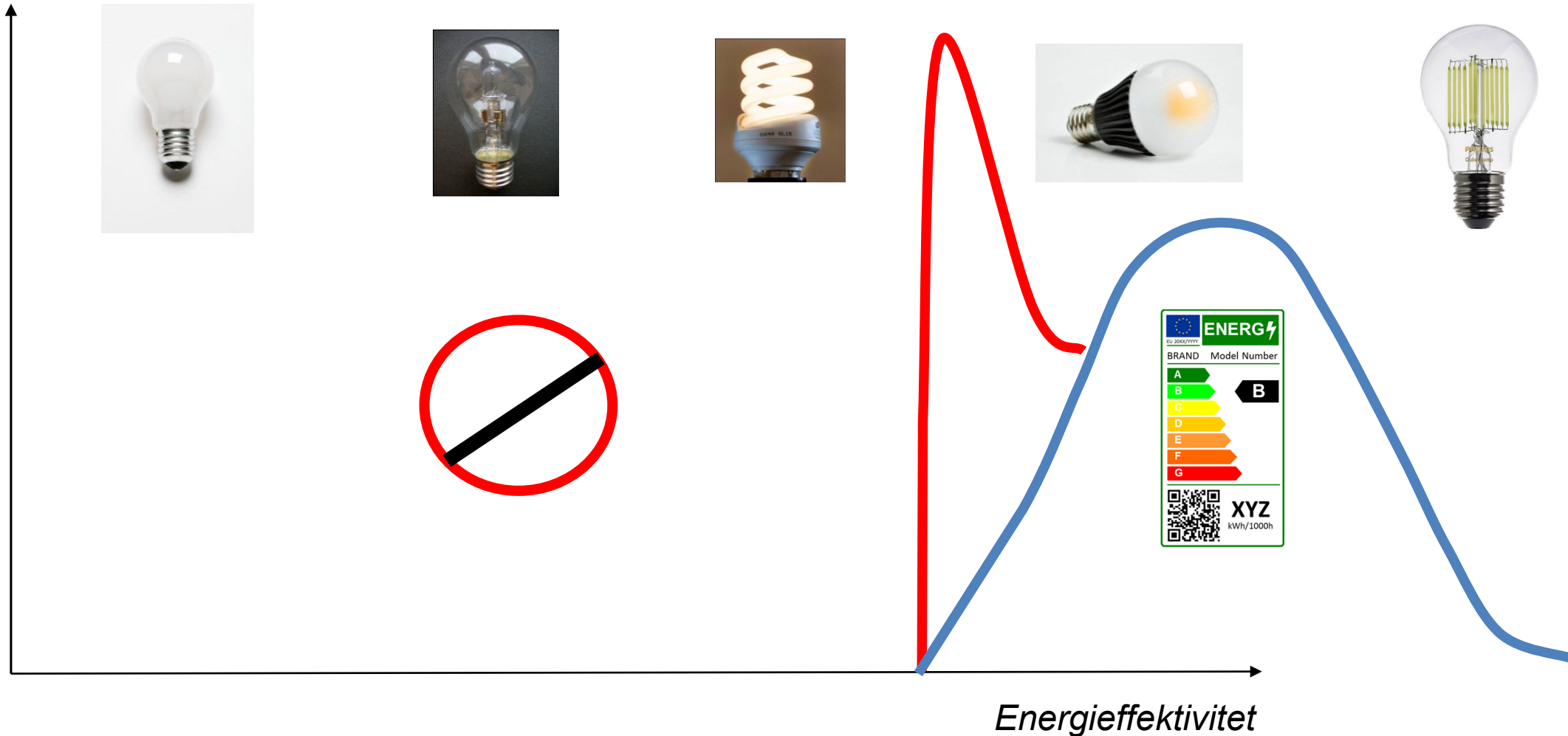


Lighting – snapshot from 1 September 2021

Ekodesign

Energimärkning

Grön...->



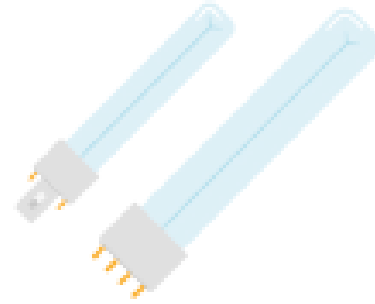
2023: Fluorescent lighting starts to get phased out



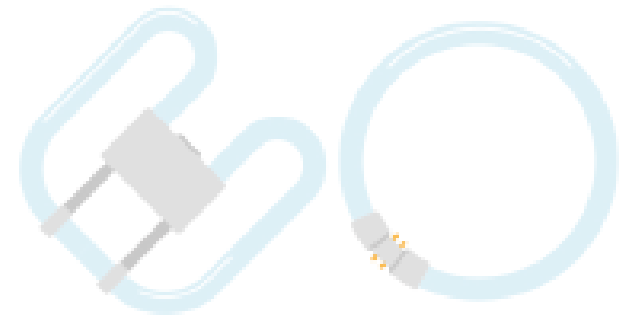
Lysrör T8



Lysrör T5



Kompaktlysrör, 2- samt 4-stift



Cirkelformade och kvadratiska lysrör

Ecodesign and RoHS are complementary tools

- EU-27 and the European Economic Area have adopted policy-measures over a decade to keep transforming the European lighting market
- **ECODESIGN Regulation – based on LCC**
 - Incandescent: 2009-12; halogen spot lamps: 2015 and halogen non-directional: 2018 [EC No 244/2009](#)
 - Halophosphate fluorescent: 2010-12; [EC No 245/2009](#)
 - CFLi, T2 and T12 Linear Fluorescent: 1 September 2021; [EU No 2019/2020](#)
 - T8 Linear fluorescent in 60 cm, 120 cm and 150 cm: 1 September 2023; [EU No 2019/2020](#)
- **RoHS Regulation – based on toxicity**
 - Removes fluorescent lighting from virtually all general purpose lighting applications on either 24 February 2023 or 24 August 2023.
 - CFLni – all base-types (single capped): 2023; [EU No 2022/276](#) (RoHS)
 - T8, T5 – all lengths and diameters: 2023; [EU No 2022/284](#) (RoHS)



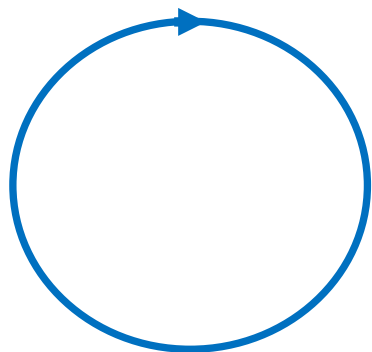
And now? – Time to address the lack of
circularity

Current discussions goes *beyond* energy efficiency

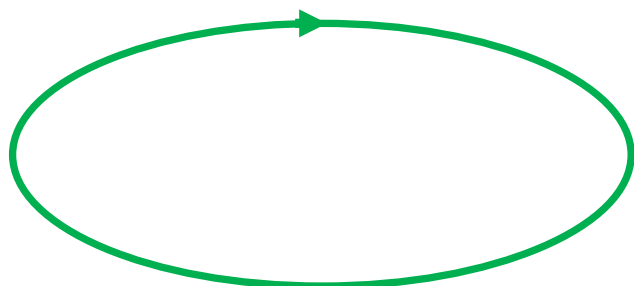
Business models:

- From Linear 

- Via Circular



- To an Elliptical economy



Resource use:

- Energy efficiency ->
- Energy sufficiency ->
- Resource efficiency ->
- Resource sufficiency

Current discussions (cont)

That is:

- *Don't use more resources than needed, when providing a service (such as lighting)*
- *Strive for as long lifetime as possible, and*
- *Ensure that the resources can be recovered at End of Life!*
- Which is mirrored in the current revision of the framework directive on ecodesign, The Ecodesign for Sustainable Products Regulation (ESPR), [Proposal for Ecodesign for Sustainable Products Regulation \(europa.eu\)](#)
- To be presented in detail by Carl Dalhammar

And for lighting?

We expect a revision of the lighting regulations to be started next year (2024) or so

Possible areas to be revised:

1. Revise the **scope**:

- Revised area in colour space (xy-coordinates)
- Revised products: likely that Street lighting will be steered towards LED

2. Revise the **lighting quality** parameters:

- CRI: expand to 2D requirements? Fidelity, gamut area etc.
- Flicker requirements for dimmed conditions?

3. And more requirements on **resource efficiency** (circular aspects)

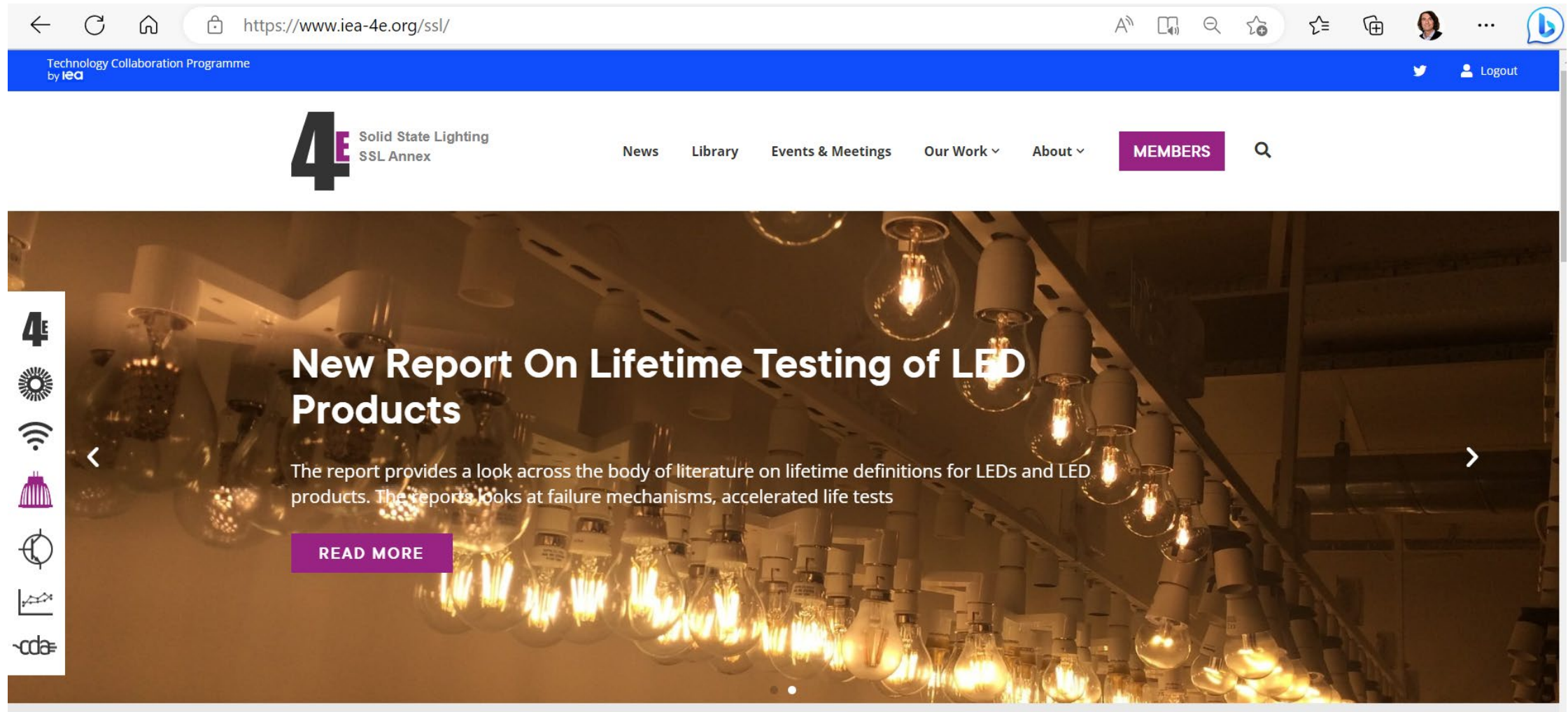
EU and beyond – the need for international collaboration

Global challenges are the *same* – make sense to collaborate

A global market but different market conditions in the various regions

- Aligned analyses of markets and technologies
- Standardisation work
- Policy work
- Capacity building work

International collaboration crucial – such as the IEA 4E SSL



[Solid State Lighting - 4E Energy Efficient End-use Equipment \(iea-4e.org\)](https://www.iea-4e.org/)

Capacity building projects, such as EELA:

- EELA: Energy Efficient Lighting and Appliances
- Financed by Swedish SIDA, led by UNIDO
- 21 countries, ca 500 million people
- Partners:
 - SACREEE – The SADC Centre for Renewable Energy and Energy Efficiency. *Regional key player in Southern Africa*
 - EACREE – The East African Centre of Excellence for Renewable Energy and Efficiency. *Regional key player in Eastern Africa*
 - CLASP – global non-profit NGO specialized in product policies
 - The Swedish Energy Agency (sharing experiences on policy making, lab testing, market screening and surveillance)

The EELA project will be delivered through the Regional Platforms.

The key executing partners are the East African Centre of Excellence for Renewable Energy and Efficiency (EACREEE) and the Southern African Development Community Centre for Renewable Energy and Energy Efficiency (SACREEE). These Platforms will also convene different stakeholders, provide a growing knowledge hub and proactively share information with the private sector and all stakeholders.

Through guidelines, workshops, best practice documentation and other activities, the Platforms will also support national governments and stakeholders to take action in their countries.



The multiple benefits of Energy Efficient Lighting and Appliances

Efficient electricity use promotes energy security, which lies at the heart of achieving the regions' economic and human development goals as well as many of the globally agreed Sustainable Development Goals (SDGs). The EELA programme is directly supporting this on many fronts.

SUSTAINABLE DEVELOPMENT GOALS



Thank you

- Jörgen Eriksson, Ileana Hagelin, Ermias Mebreku: Testing Testlab
- Helena Holm: Communication
- Peter Bennich: Policy, International collaboration
- ... and more colleagues to come!

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