Challenges facing policy makers, what is happening in the EU? IEA 4E SSL Seminar 2023-03-27 Peter Bennich

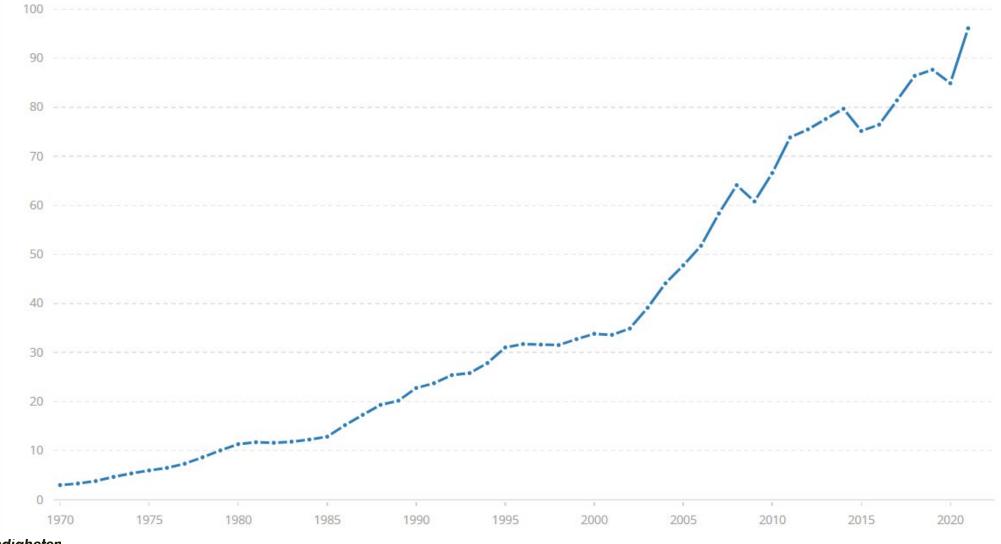
The Swedish Energy Agency



Background



GDB 1970 – 2021 [Relative scale]



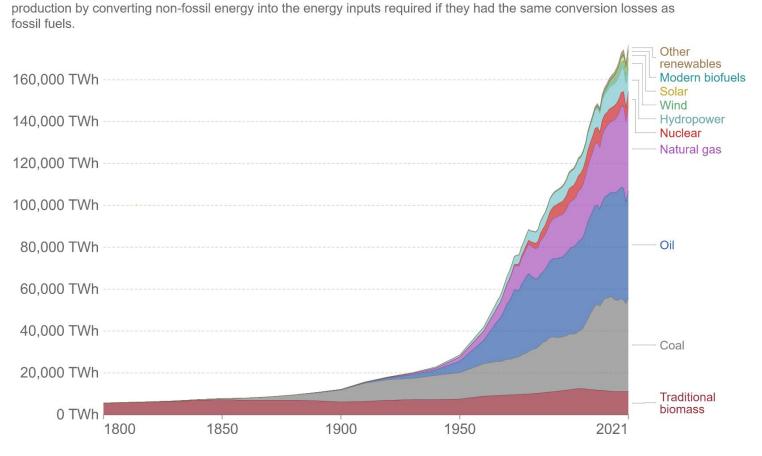
K Energimyndigheten

Global energy mix 1800 – 2021 From 1950: *The great acceleration*

Primary energy is calculated based on the 'substitution method' which takes account of the inefficiencies in fossil fuel

Our World in Data

Global primary energy consumption by source





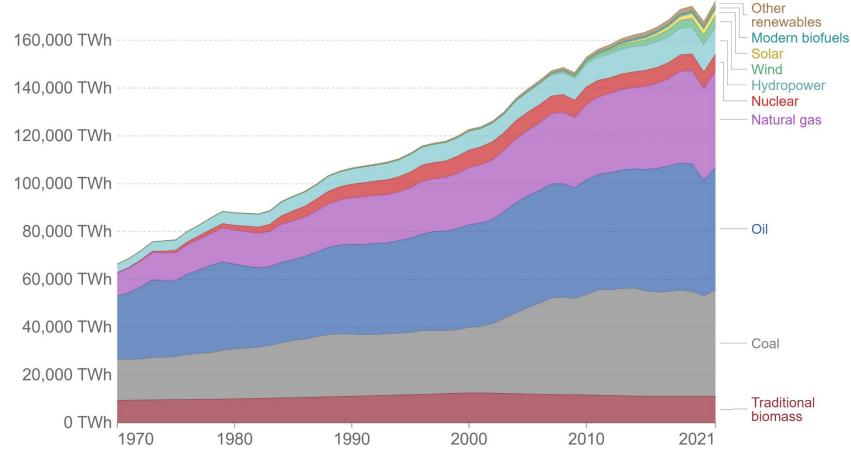
Source: Our World in Data based on Vaclav Smil (2017) and BP Statistical Review of World Energy OurWorldInData.org/energy • CC BY

Global energy mix 1970 - 2021

Global primary energy consumption by source

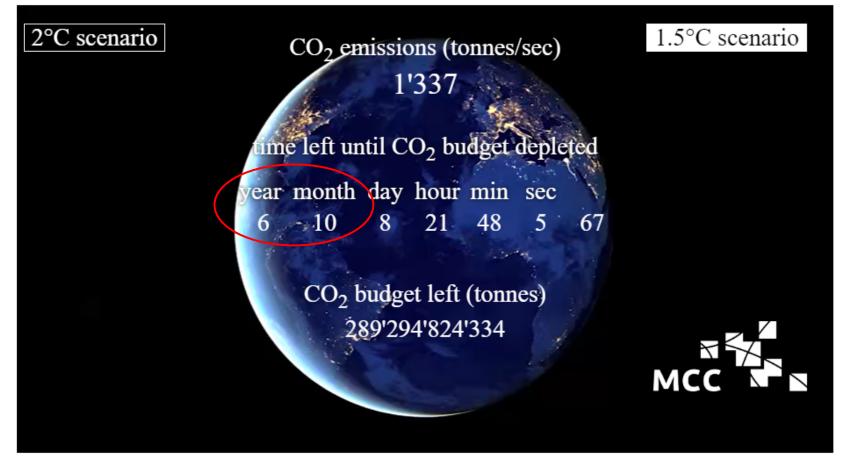


Primary energy is calculated based on the 'substitution method' which takes account of the inefficiencies in fossil fuel production by converting non-fossil energy into the energy inputs required if they had the same conversion losses as fossil fuels.





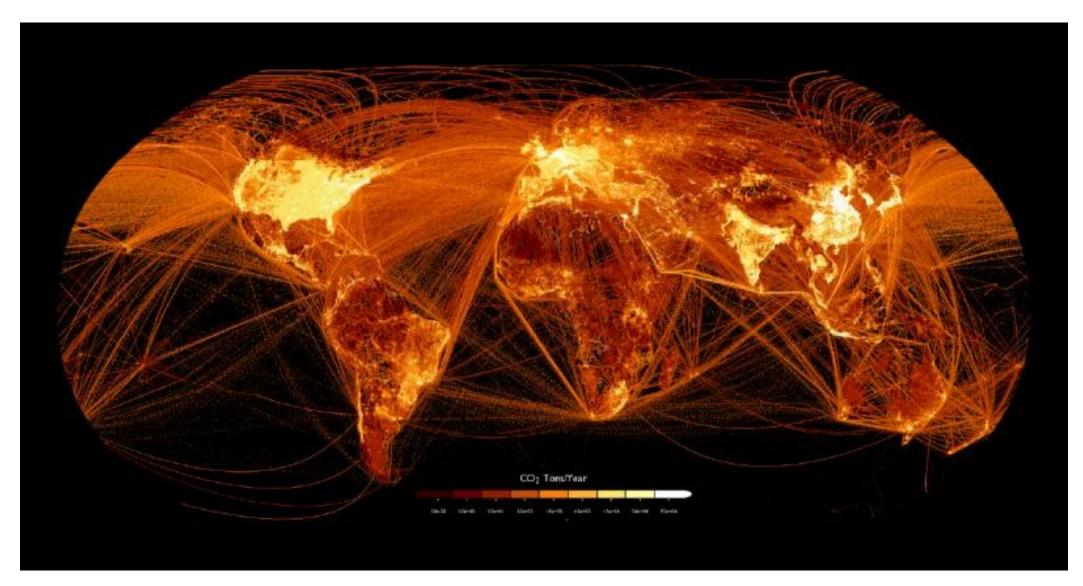
The CO₂-budget is shrinking fast



Harsh message: Only 289 Gt CO_2 left in the budget, emissions ca 42 Gt CO_2 /yr -> ca 7 years left with the current emission rate... 36 ton/capita!

Source: <u>Remaining carbon budget - Mercator Research Institute on Global Commons and Climate Change (MCC) (mcc-berlin.net)</u> [Downloaded 22-09-13]

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.

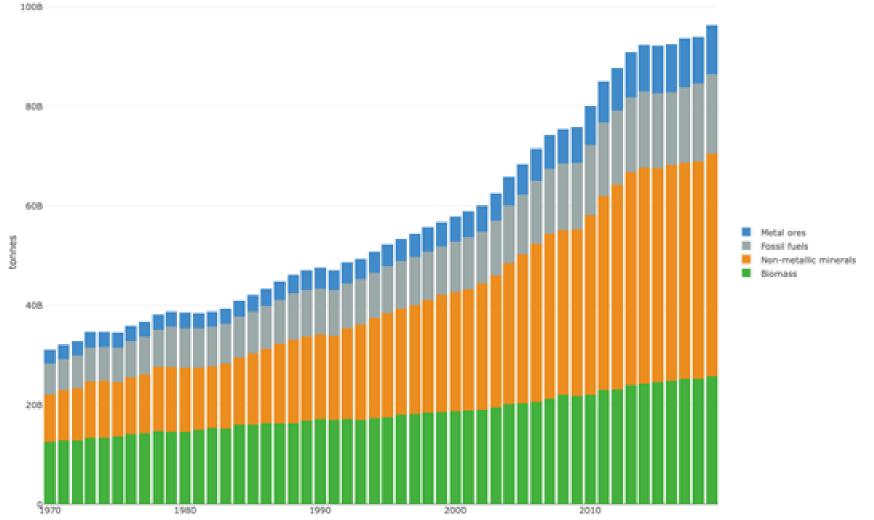
READ THE REPORT

CORE WRITING TEAM

AR6 Synthesis Report: Climate Change 2023 — IPCC

Material use 1970-2019

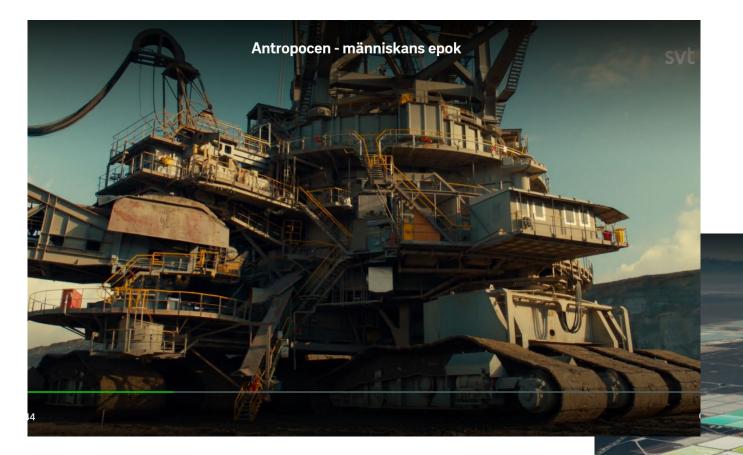
Domestic Extraction of World in 1970-2019, by material group



Time



Pictures from "Antropocen" (2018)

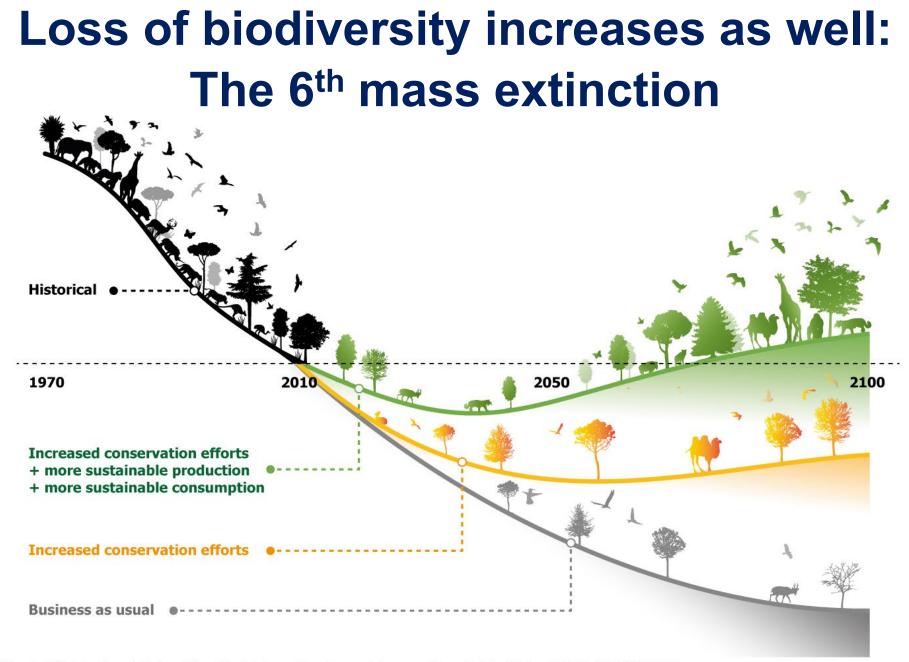


Big Digger, digging for coal

Antropocen - människans epok

svt

Salines in Chile – lithium production



Energy Agency This artwork illustrates the main findings of the article, but does not intend to accurately represent its results (https://doi.org/10.1038/s41586-020-2705-y)

Swedish

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

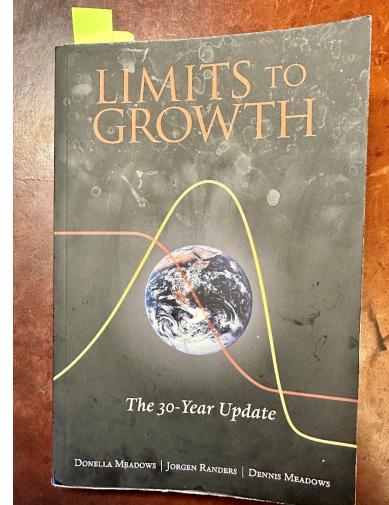


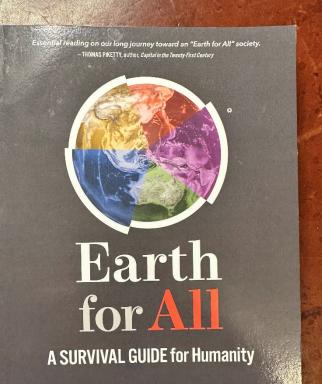
Critical questions

- 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 CO_2 -budget?
 - If no: what to do... but to decrease the consumption dramatically?
- 2. EU: Assumes decoupling *is* possible
- 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





Sandrine Dixson-Declève | Owen Gaffney Jayati Ghosh | Jorgen Randers Johan Rockström | Per Espen Stoknes Forewords by Christiana Figueres and Elizabeth Wathuti

A REPORT TO THE CLUB OF ROME

What We Think About



Toward a NEW PSYCHOLOGY of Climate Action

Per Espen Stoknes Foreword by Jorgen Randers

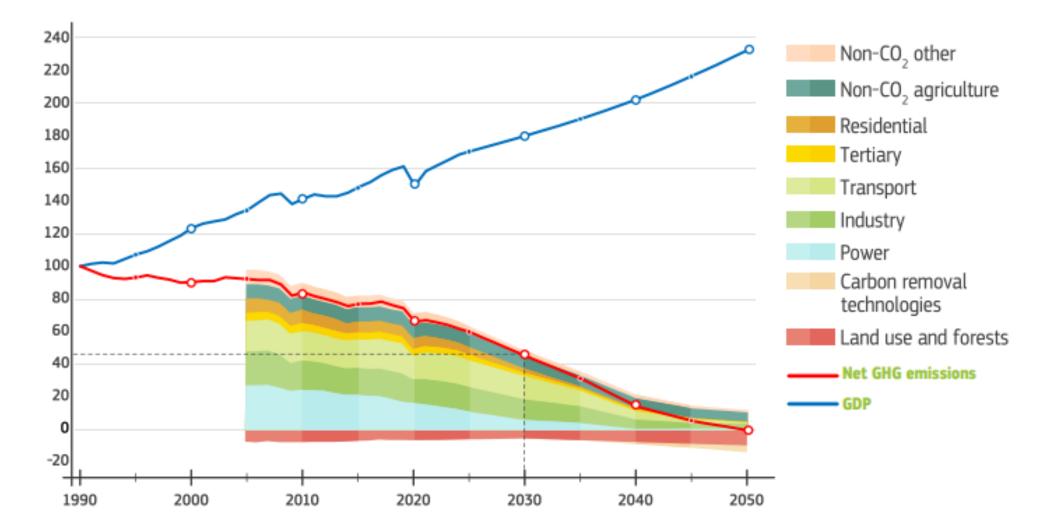


The response in EU: Reduce CO₂-emissions by 55 % to 2030 *The Fit for 55 package*



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

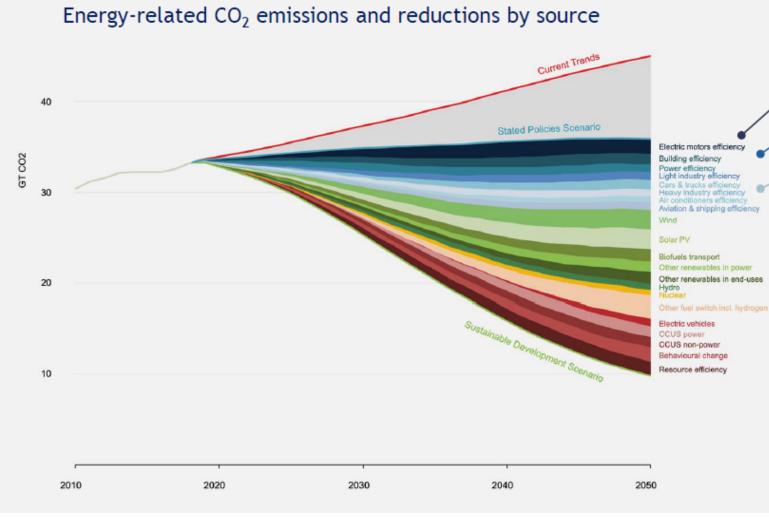


Effort Sharing

 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



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



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**.

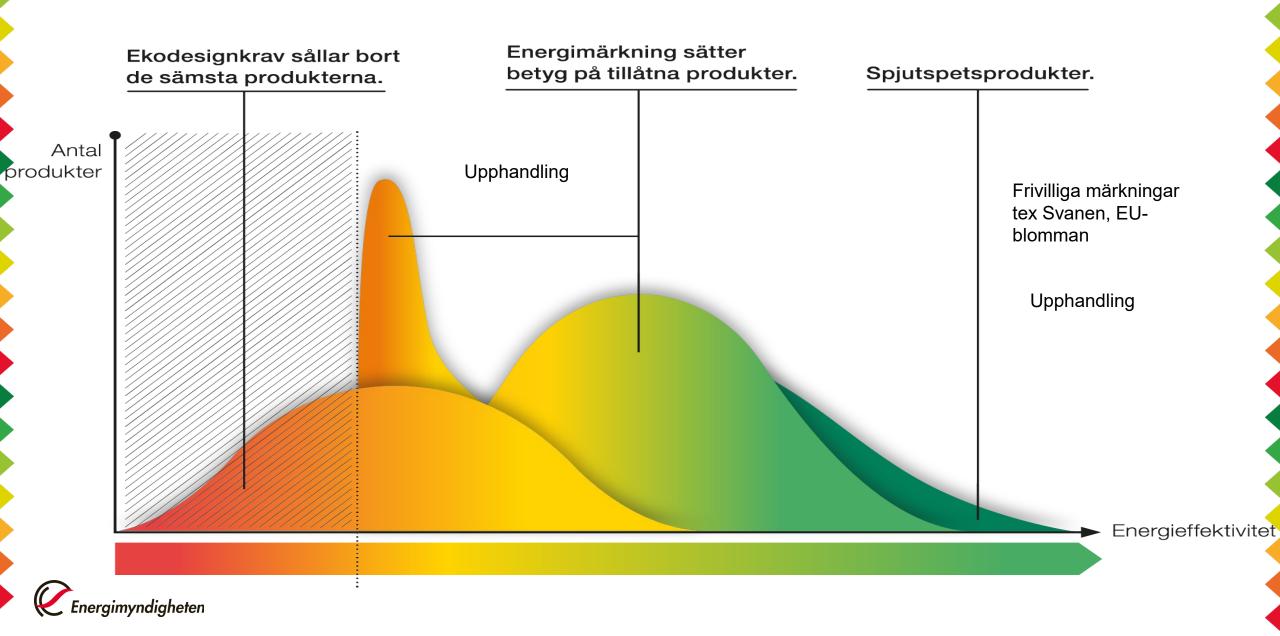
UNEP Emissions Gap Report (2017) notes that efficient appliances is one of the six areas with **highest potential of closing emissions** gap to Paris.

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

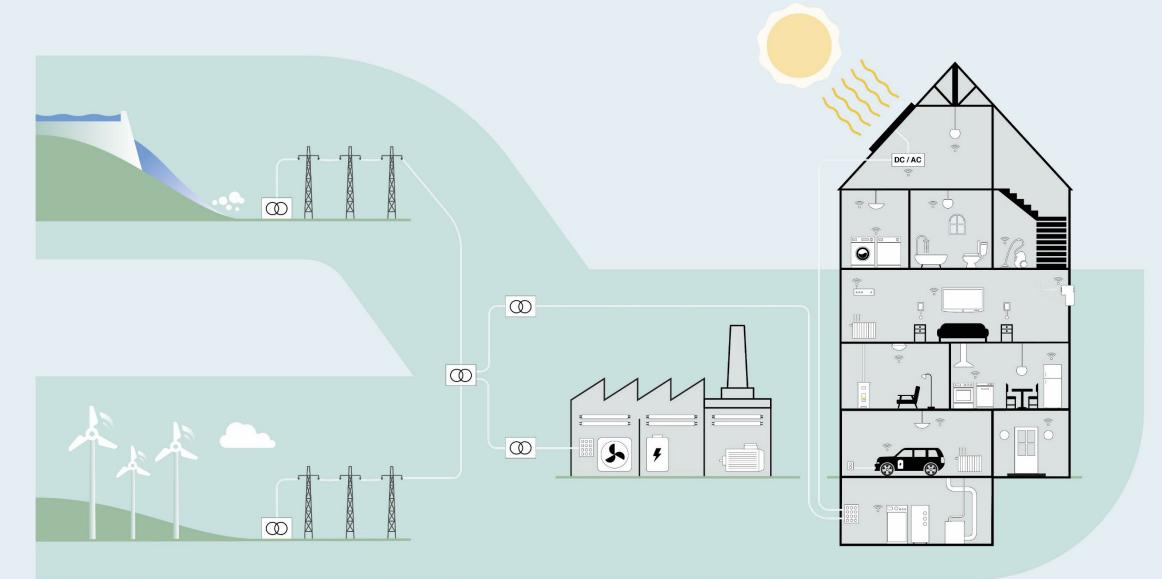
Ecodesign and energy labelling - The main policy tools to acheive energy efficient products

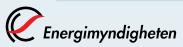


Ecodesign is a process that drives innovation

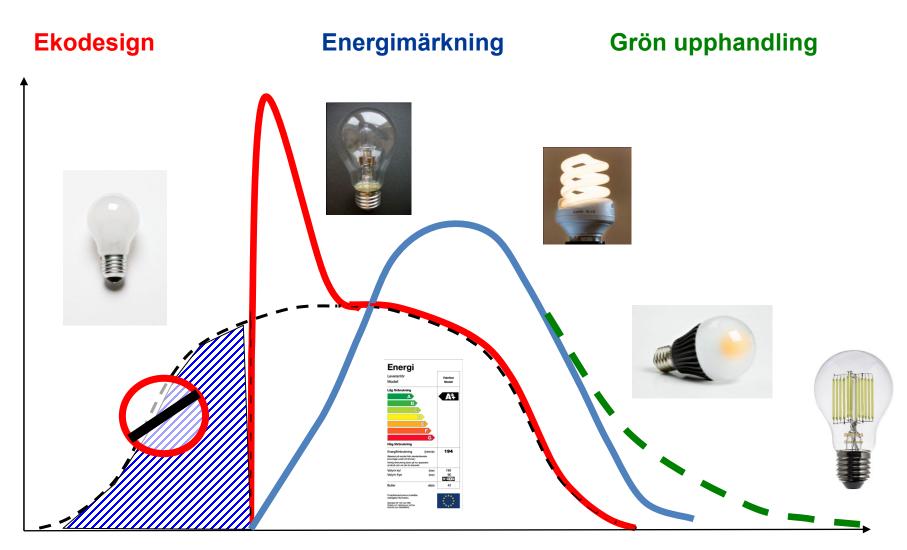


Ca 30 products are regulated by ecodesign and/or energy labelling



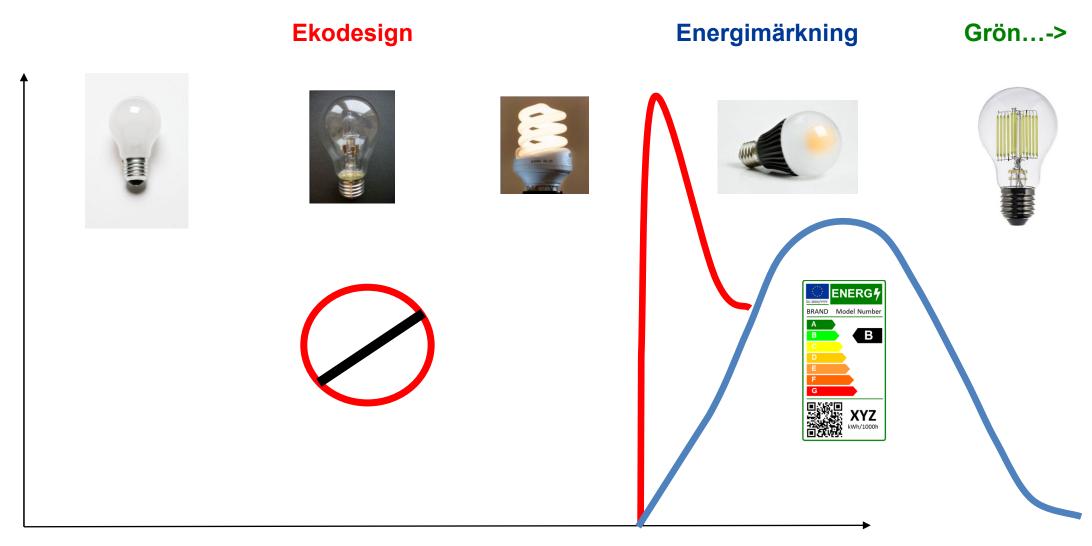


Example: Lighting – snapshot from 2012



Energieffektivitet

Lighting – snapshot from 1 September 2021



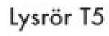
Energieffektivitet

2023: Fluorescent lighting starts to get phased out



Lysrör T8







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 <u>EC No 244/2009</u>
 - Halophosphate fluorescent: 2010-12; <u>EC No 245/2009</u>
 - CFLi, T2 and T12 Linear Fluorescent: 1 September 2021; <u>EU No 2019/2020</u>
 - T8 Linear fluorescent in 60 cm, 120 cm and 150 cm: 1 September 2023; <u>EU No 2019/2020</u>
- 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; <u>EU No 2022/276</u> (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), <u>Proposal for Ecodesign for Sustainable</u> <u>Products Regulation (europa.eu)</u>
- 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)



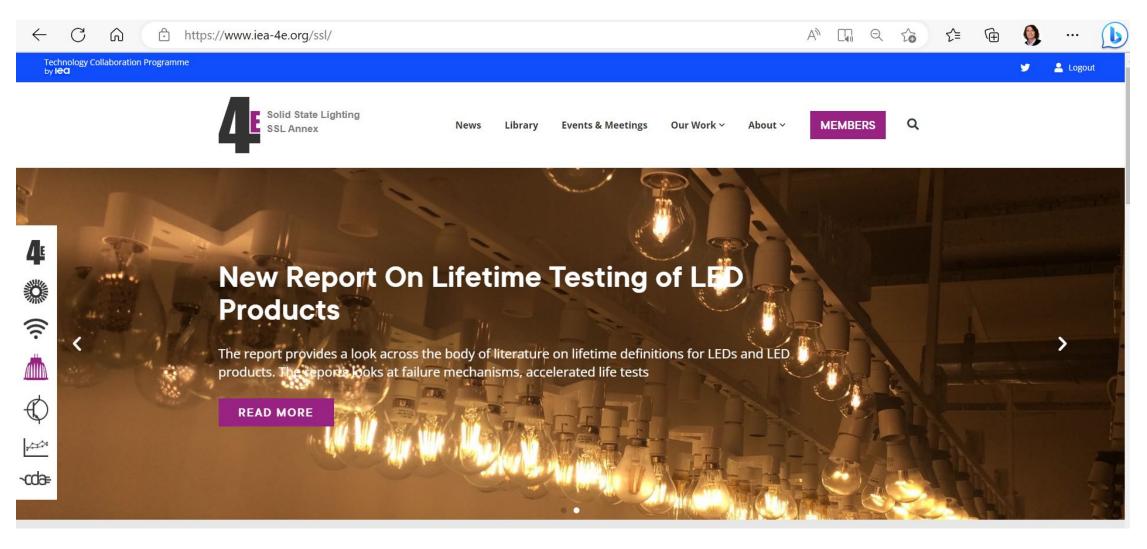
EU and beyond – the need for international collaboration



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)

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 GOALS

*

PRIVATE SECTOR SUPPORT 17 INTRE DALLS To help ensure better access to energy services across East and Southern Africa, EELA is forging partnerships with key stakeholders and will particularly engage with the private sector to inject new investment and build the capacity of governments and public officials to expand energy services.

CLIMATE ACTON 13 📖 EELA contributes to a climate action in many ways such as reducing emission through the widespread use of more energy efficient products, while also limiting the use of substances in inefficient cooling products.

RESPONSIBLE PRODUCTION AND CONSUMPTION

Through its focus on safe environmental management of products, development of MEPS and promotion of energy management systems by large power users, EELA also supports responsible production and consumption.

SUSTAINABLE CITIES

and communities.

By promoting energy efficient street lighting, alongside the use of less electricity to run appliances, EELA supports sustainable cities



POVERTY ERADICATION

Access to clean affordable sustainable energy remains key for eradicating poverty. By making more energy-efficient products readily available on the market, the EELA project will reduce household energy bills and expand the provision of clean energy services to households across East and Southern Africa.

HEALTH AND WELLBEING

Air pollution led to some 7 million deaths worldwide in 2016. The shift to energy efficient lighting and appliances, promoted through EELA, contributes to health and wellbeing across East and Southern Africa by enabling people to access clean lighting and appliances.

GENDER INCLUSIVENESS

Women are often most affected by low quality products in households. EELA will empower women by expanding their access to quality products and by supporting women entrepreneurs to become more active in markets for energy efficient lighting and appliances.

ENERGY FOR ALL

(e)

As energy consumption accounts for around 60 percent of total global greenhouse gas emissions, according to the UN, achieving climate safe universal access to electricity will require a doubling of energy efficiency improvement rates. The potential for energy saving across East and Southern Africa is huge. EELA estimates that introducing MEPS in the regions through the project could save the equivalent of five to eight times Kenya's total electricity consumption.



JOB CREATION

EELA promotes activities that stimulate local markets to produce, assemble and distribute quality energy efficient lighting and appliances, creating new employment opportunities.

SUSTAINABLE INDUSTRIALIZATION

Through its investments, EELA will also stimulate better infrastructure and industrial production. Energy accounts for a large amount of production costs and EELA will support local industries to become more competitive. At the same time, local manufacturing of products will be promoted.



Thank you

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

Besök oss på www.energimyndigheten.se

Prenumerera på nyheter, nyhetsbrev, utlysningar med mera på www.energimyndigheten.se/prenumerera



