

German Environment Agency

**Umwelt
Bundesamt** 

The nexus between resource use and climate change

Making Europe more resource efficient and climate friendly

Dr. Harry Lehmann

German Environment Agency (UBA)

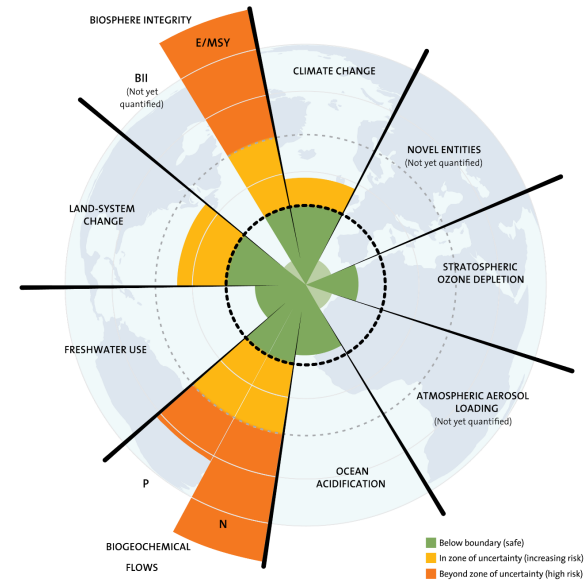
Goals



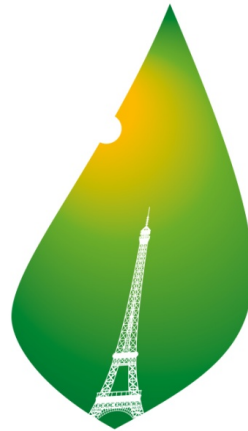
SUSTAINABLE DEVELOPMENT GOALS
17 GOALS TO TRANSFORM OUR WORLD



International
Resource
Panel



100% RENEWABLES
www.go100re.net

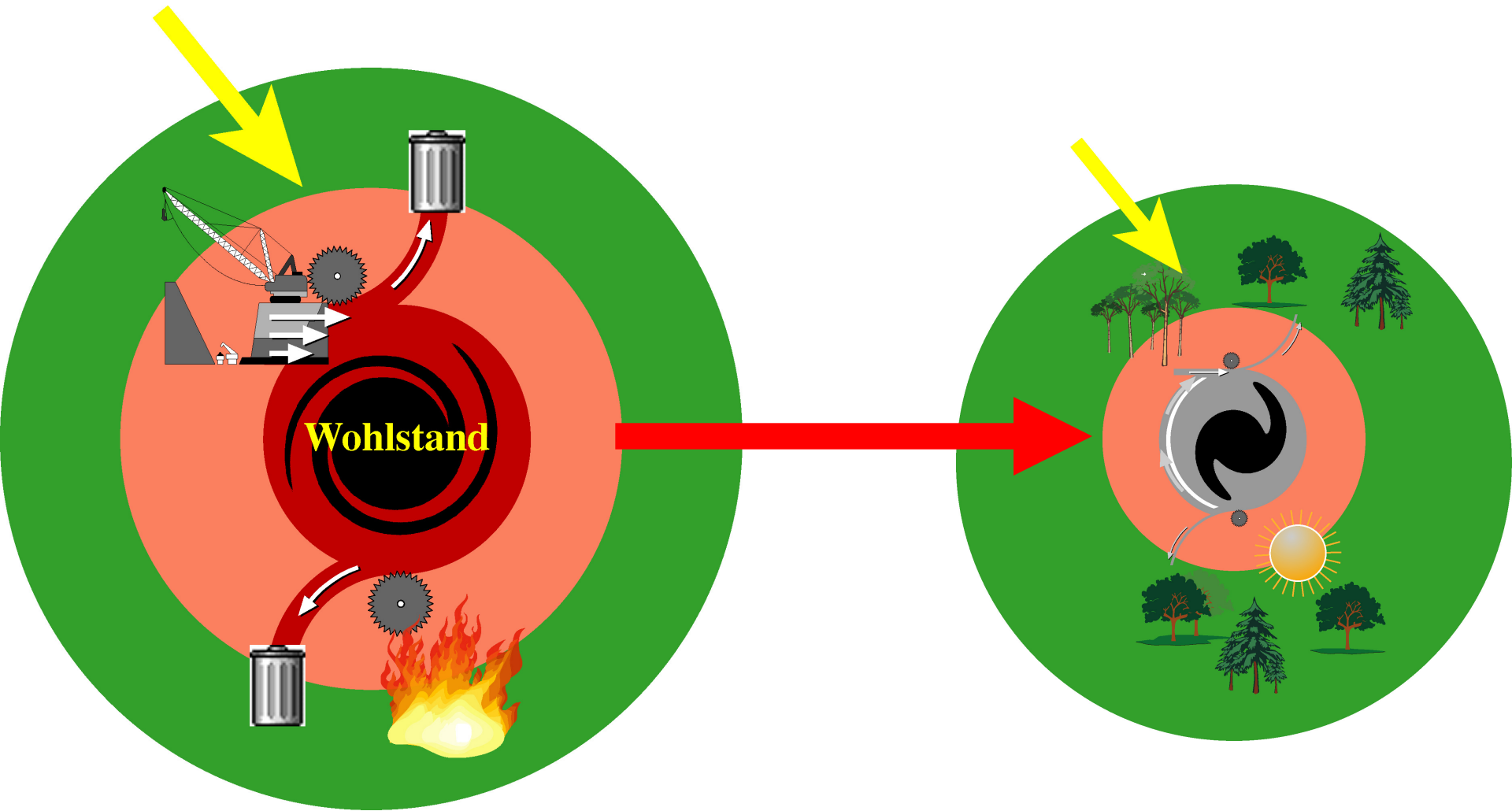


COP21 • CMP11
PARIS 2015
UN CLIMATE CHANGE CONFERENCE

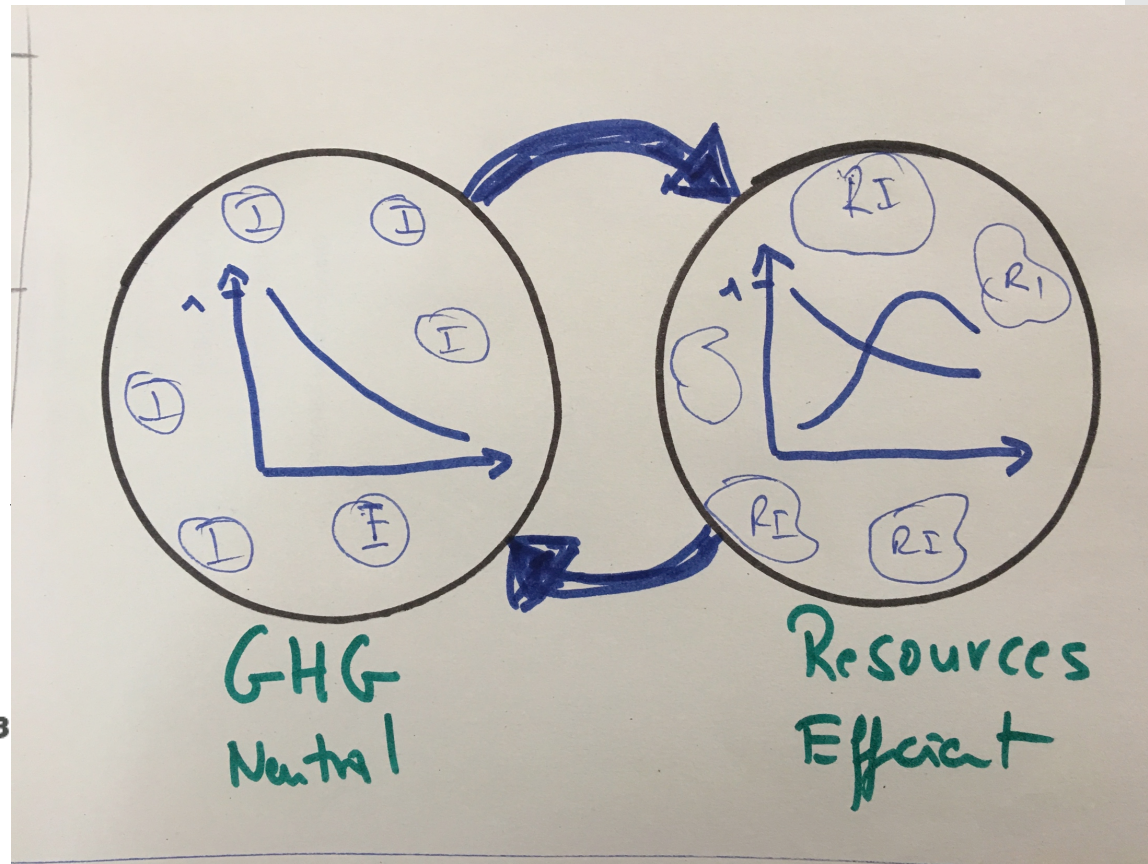
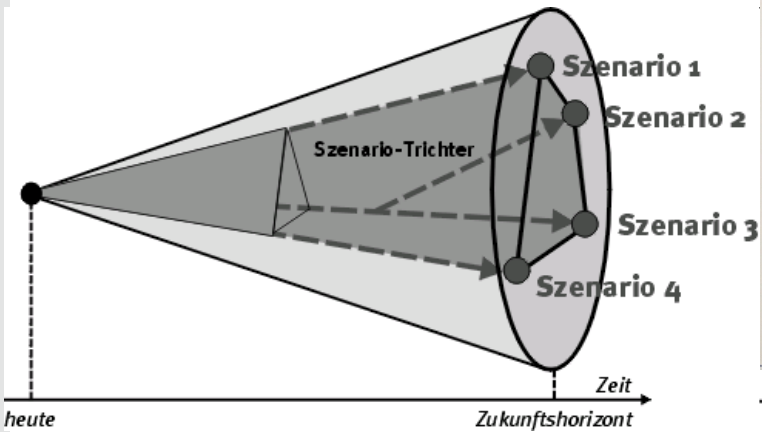


Energie wende
Switch to the Future

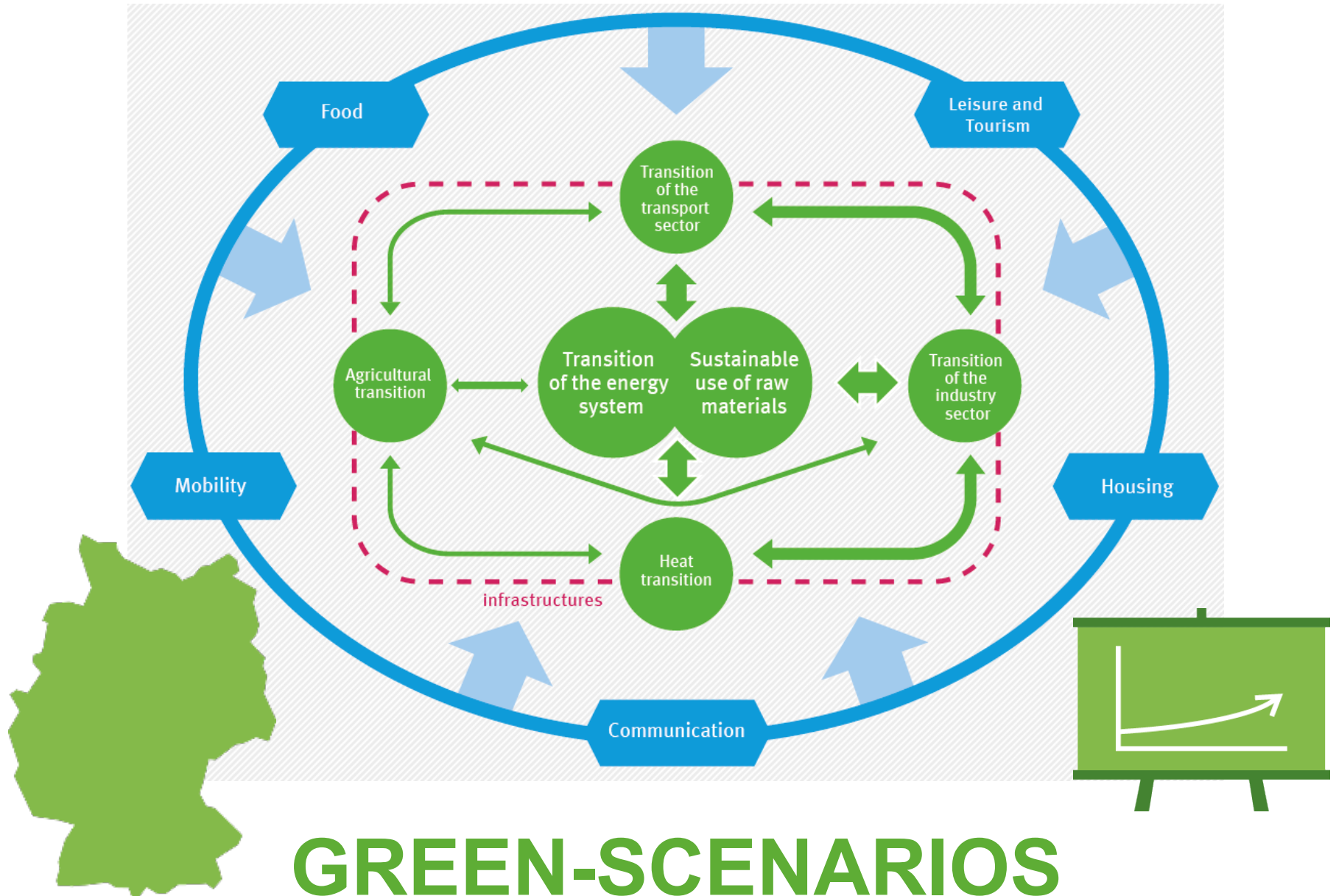
„Great Transformation“



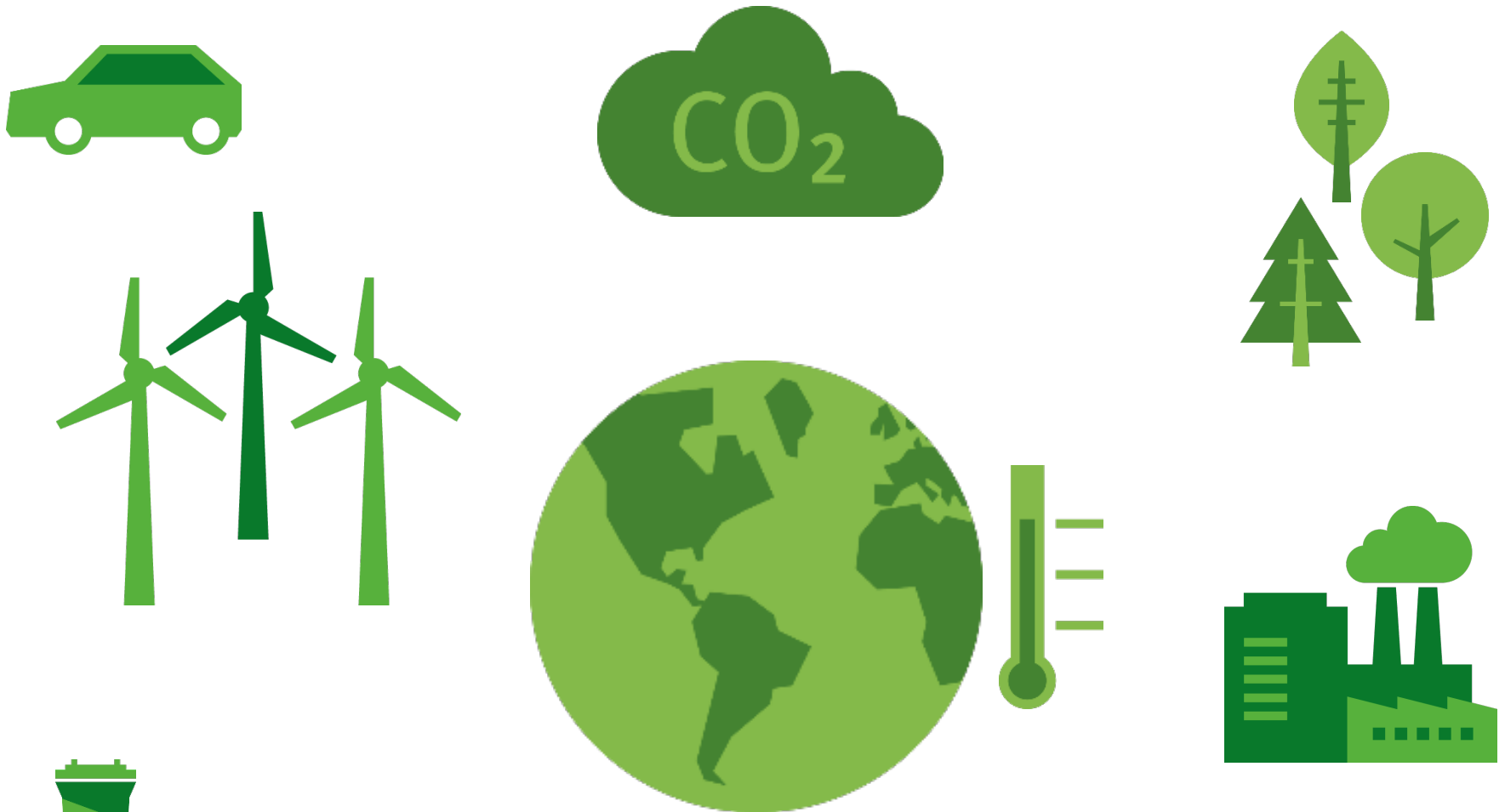
Goals and Scenarios



RESCUE – Resource-Efficient Pathways towards Greenhouse-Gas-Neutrality

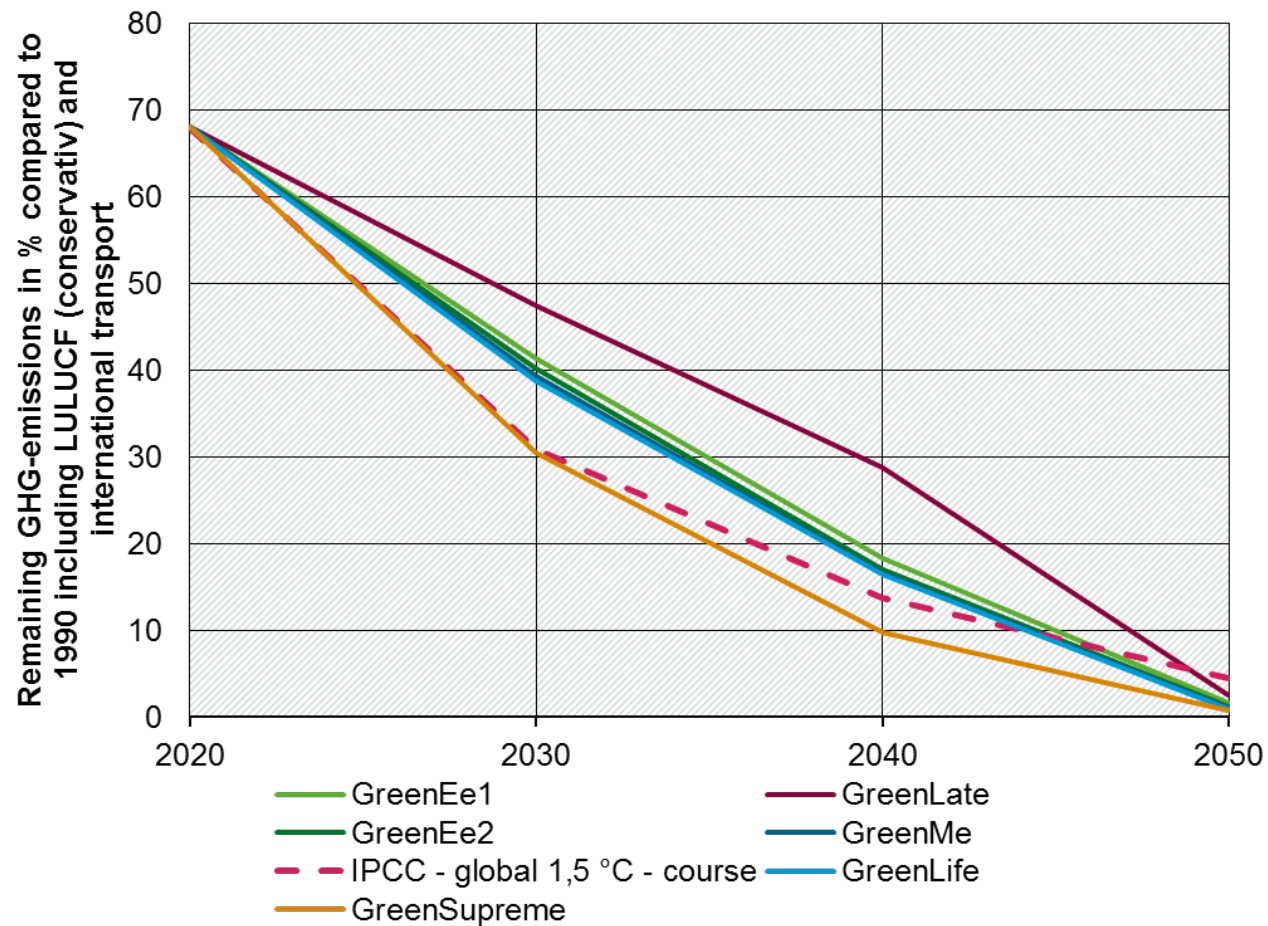


RESCUE – Resource-Efficient Pathways towards Greenhouse-Gas-Neutrality



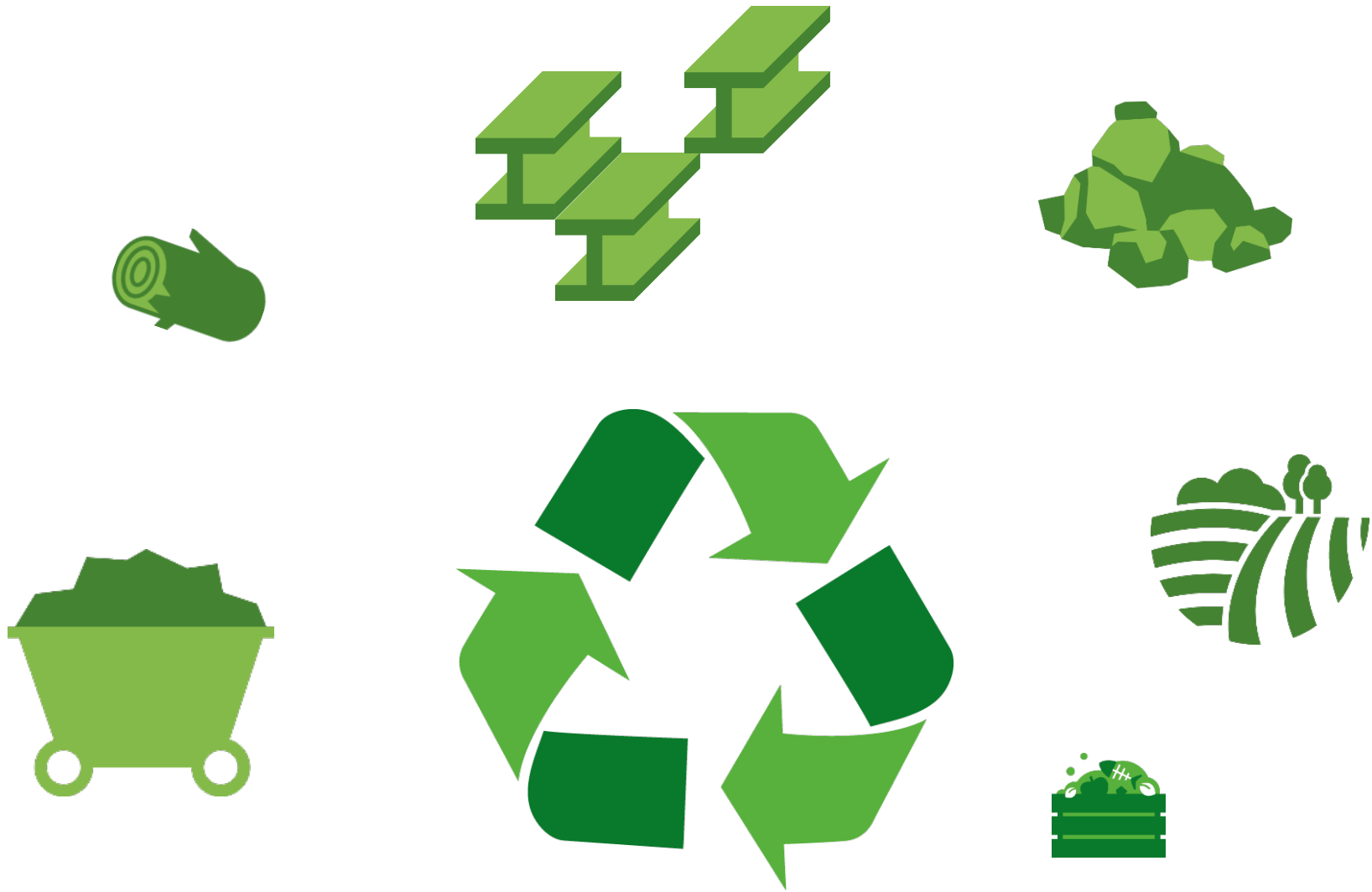
CLIMATE PROTECTION

RESCUE – Resource-Efficient Pathways towards Greenhouse-Gas-Neutrality



- Only GreenSupreme, represents a nearly compatible transformation path.

RESCUE – Resource-Efficient Pathways towards Greenhouse-Gas-Neutrality

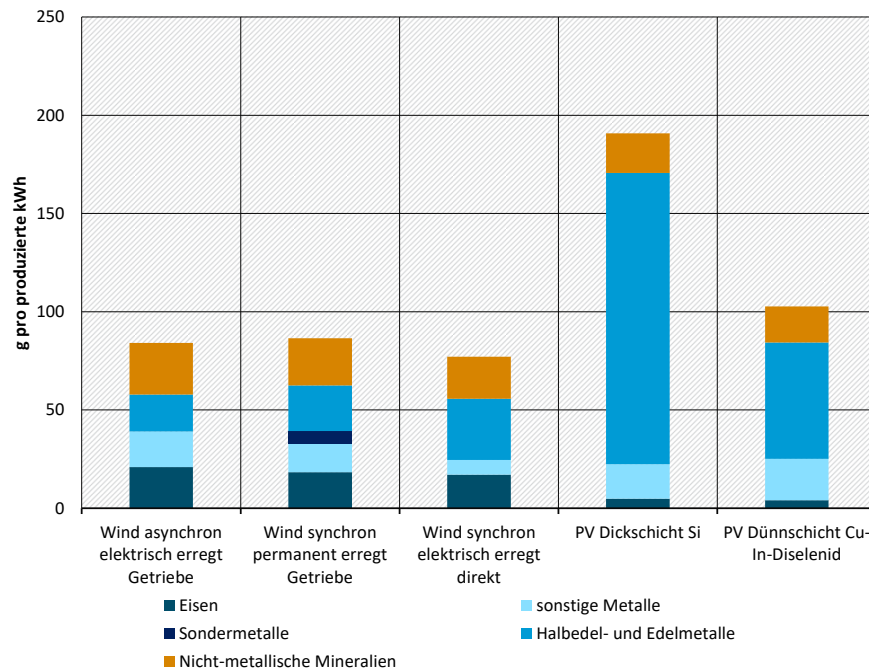


RAW MATERIALS USE

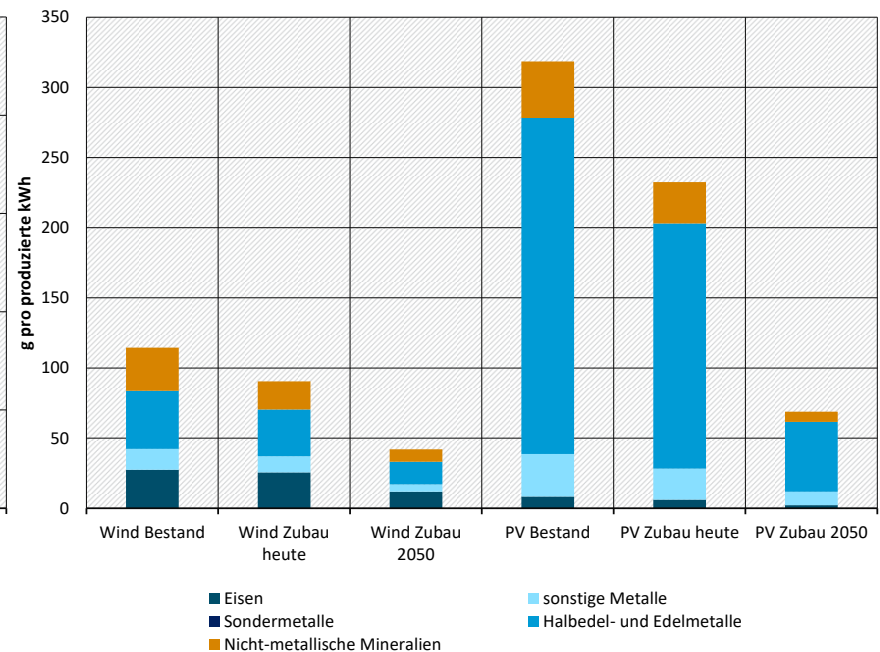
RESCUE – Resource-Efficient Pathways towards Greenhouse-Gas-Neutrality

Resources and Technologies ...

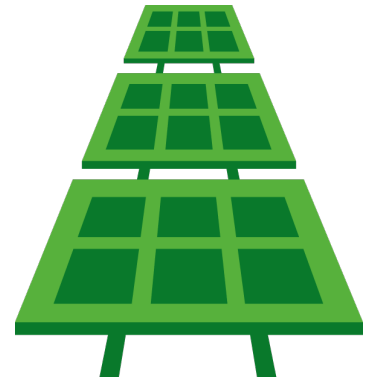
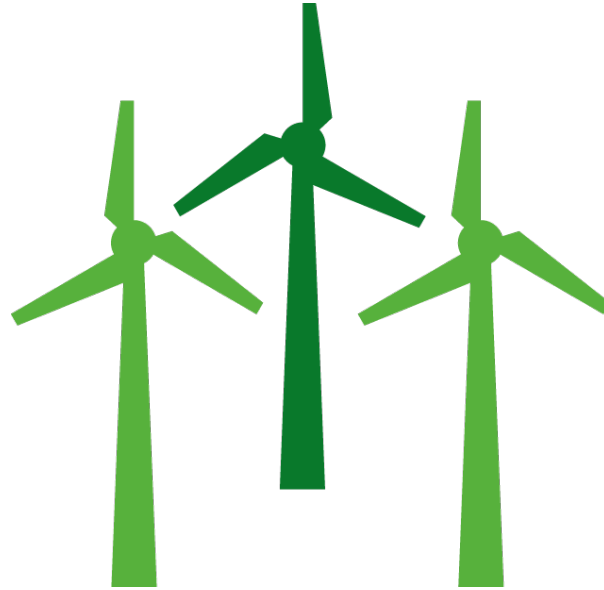
Rohstoffnutzung ausgewählter einzelner Energieerzeugungsanlagen (heutiger Stand) im Vergleich



Entwicklung der Rohstoffnutzung ausgewählter einzelner Energieerzeugungsanlagen im Vergleich

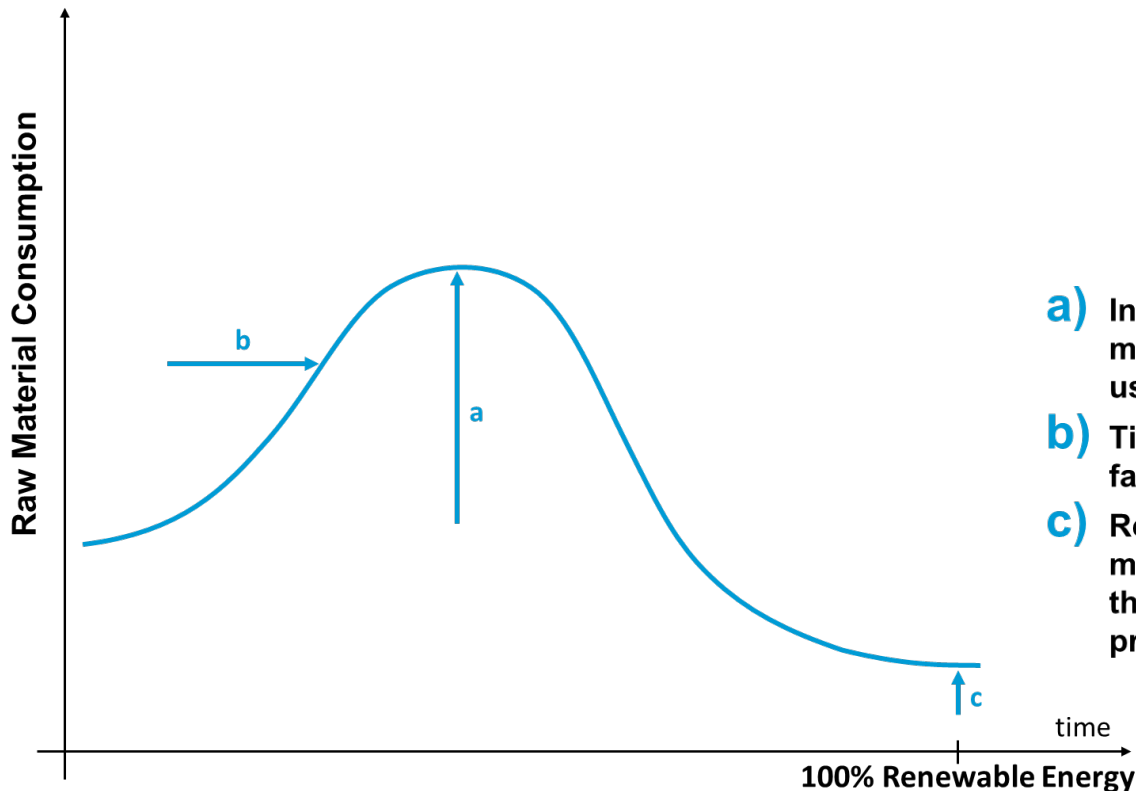


Quelle: Wiesen et al. (2017) „Analyse des Rohstoffaufwandes der Energieinfrastruktur in Deutschland“. Sachverständigengutachten, unveröffentlicht



GLOBAL OUTLOOK ENERGY-SYSTEM

Interaction of renewable energies and raw materials

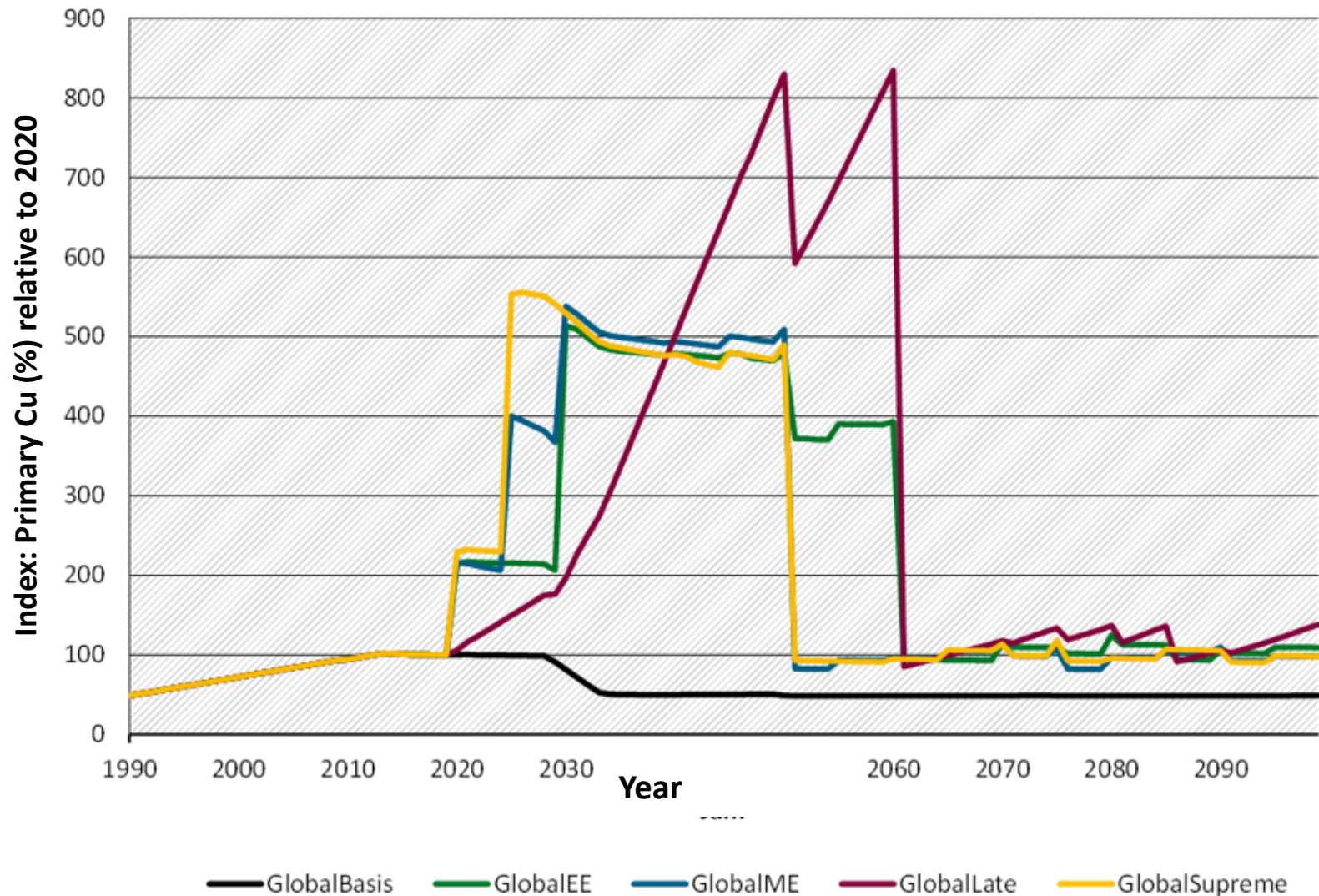


- a)** Influenced by efficiency (energy and material) – the more efficiently material is used, the lower the curve
- b)** Timing & speed of RE integration – the faster, the steeper the curve
- c)** Recycling or saving of primary raw materials – the higher the recycling rate, the lower the permanent extraction of primary raw materials

- The phase-out of fossil energy has benefits for climate protection and the consumption of raw materials.
- energy-related GHG-emissions can be reduced to zero
- Raw material consumption can not be reduced to zero

RESCUE – Resource-Efficient Pathways towards Greenhouse-Gas-Neutrality

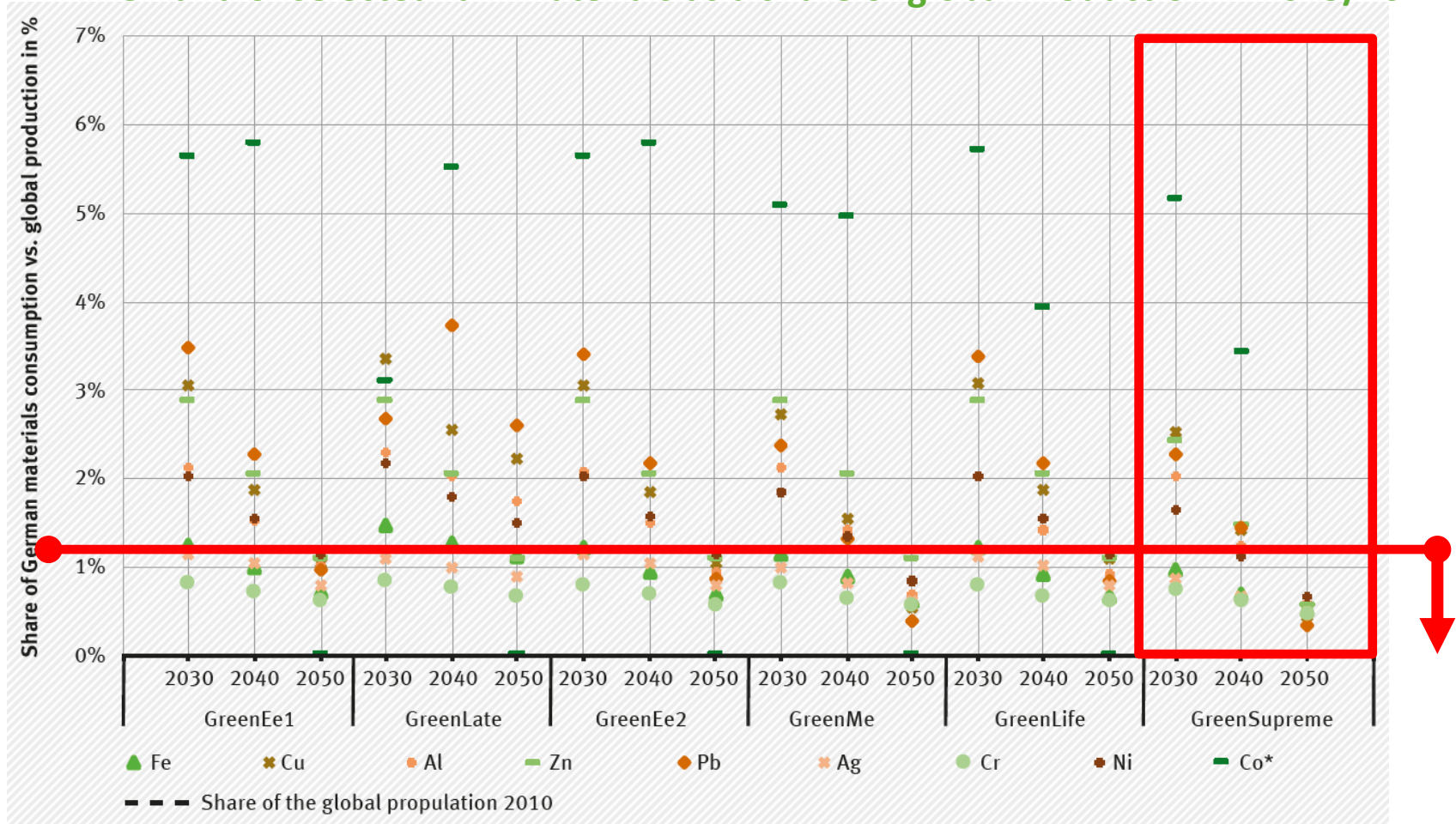
Global Transferability copper (Cu) demand for the renewable energy system



RESCUE – Resource-Efficient Pathways towards Greenhouse-Gas-Neutrality

Global Fairness

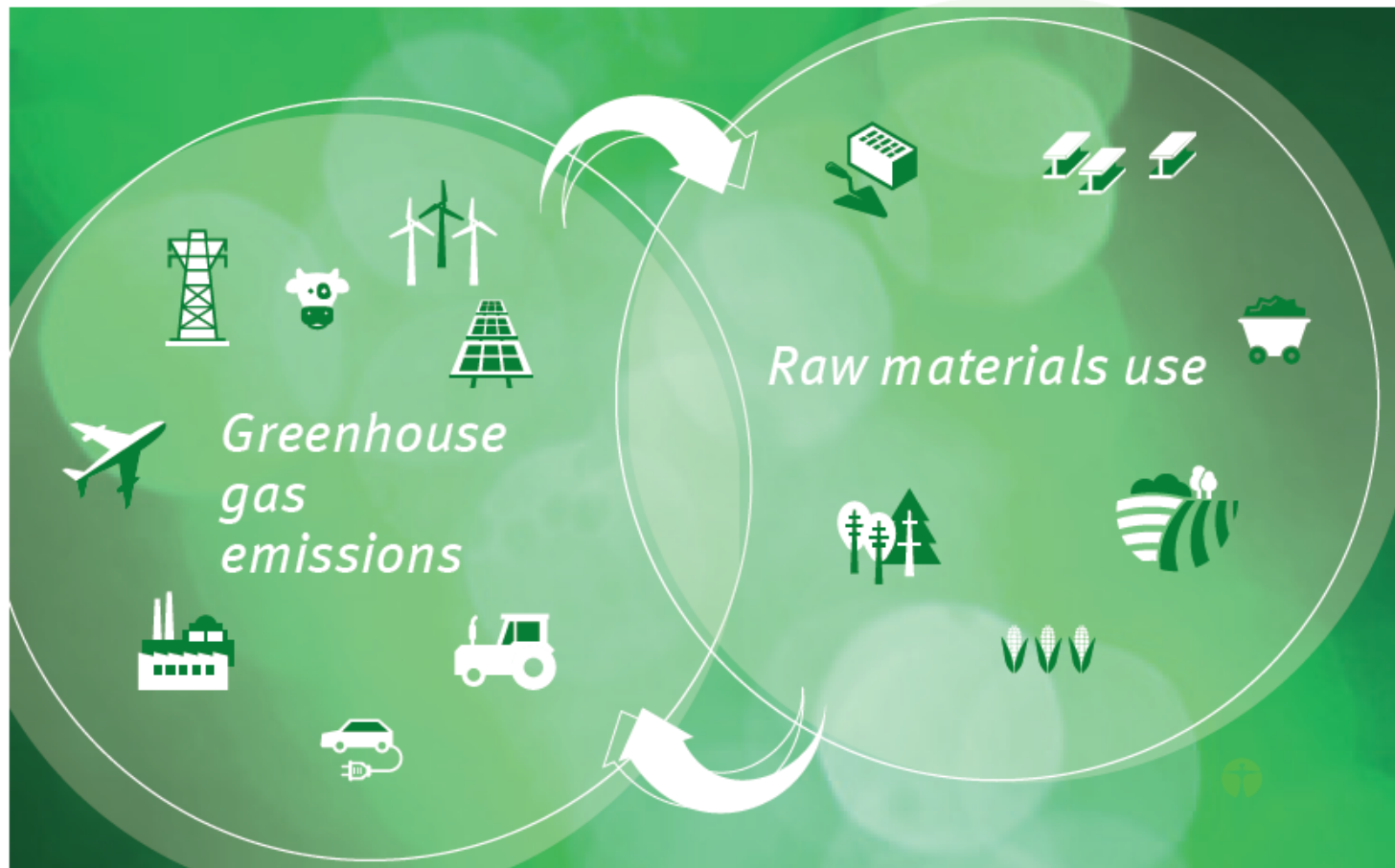
Demand of selected raw materials as a share of global Production in 2015/16



* Estimate only for batteries used in transportation.

** Germany's population in 2010 was 81.75 million people and the global population equaled 6.96 billion people (81.75 million people / 6.96 billion people = 1.17 %).

Note: Global production estimates were taken from USGS for the latest year available. For chromium, the production data from chromite was used and a metal content of 30 % assumed.



CONCLUSIONS



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