

Low Carbon energy intensive industries

Session 3.3 LCSRNet 8 th Meeting

Chairs:

Prof. Dr. Manfred Fischedick

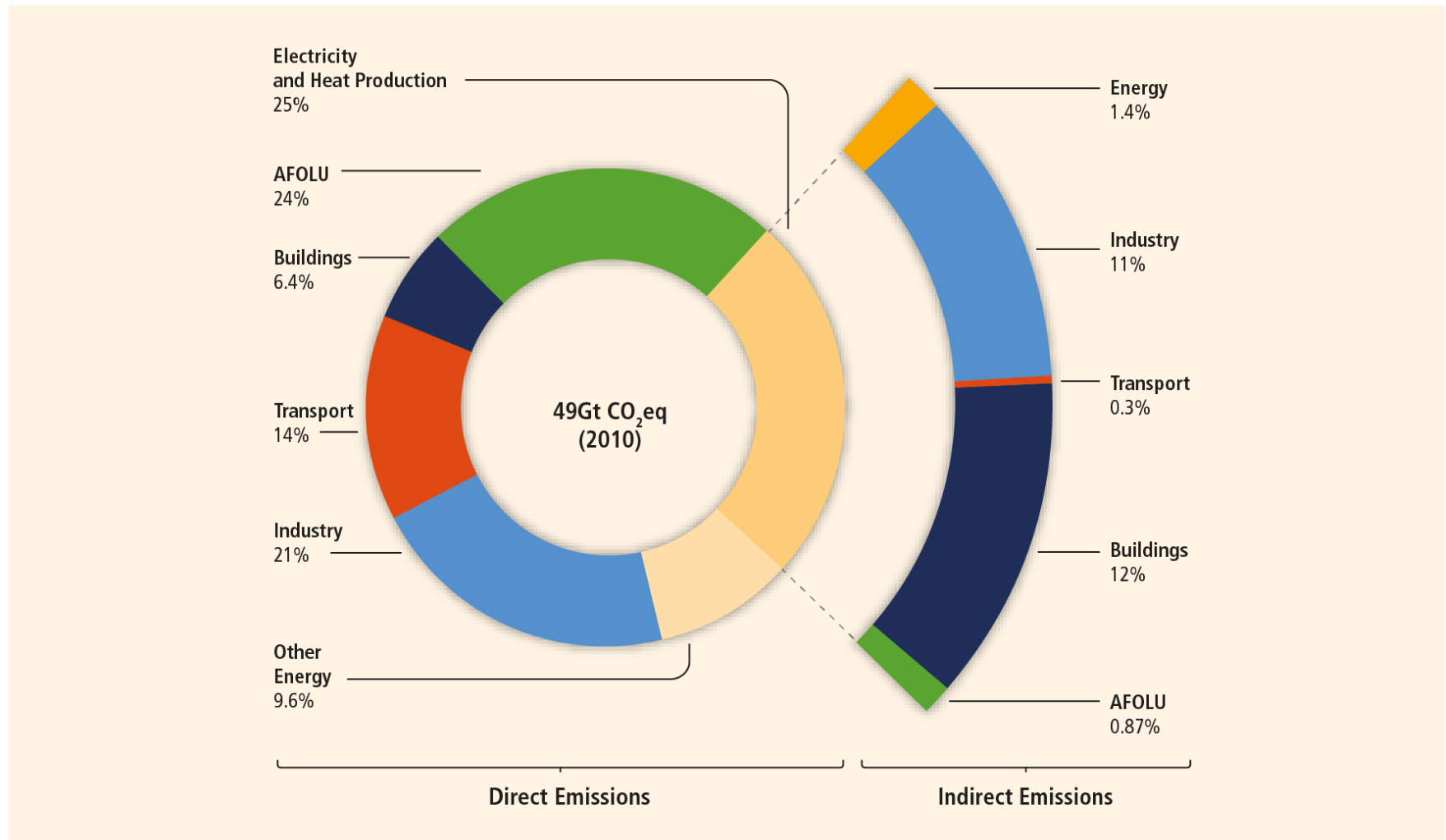
Prof. Dr. Joashree Roy

September, 7th

- **Why the topic of the session is relevant?**
- **Where industry related GHG emissions come from (sector and country breakdown)?**
- **Which GHG mitigation options do we have?**
- **What are we discussing today?**
 - **General framing:** Lars J. Nilsson (Lund University, Sweden): Re- thinking basic materials: Results from the GIST Research programme
 - **Regional focus:** Joyashree Roy (Javadpur U.): Deep decarbonization in Industries - what does it mean for India?
 - **Technology focus:** Arturo Castillo Castillo (ICL, UK): Carbon Capture and Use: Options for decarbonising Industries in Europe? Results from the enCO2re project
 - **Stakeholder focus:** Caroline Kroes (Port of Rotterdam): Decarbonisation and the Port of Rotterdam, challenges and opportunities

Why topic of the session is relevant?

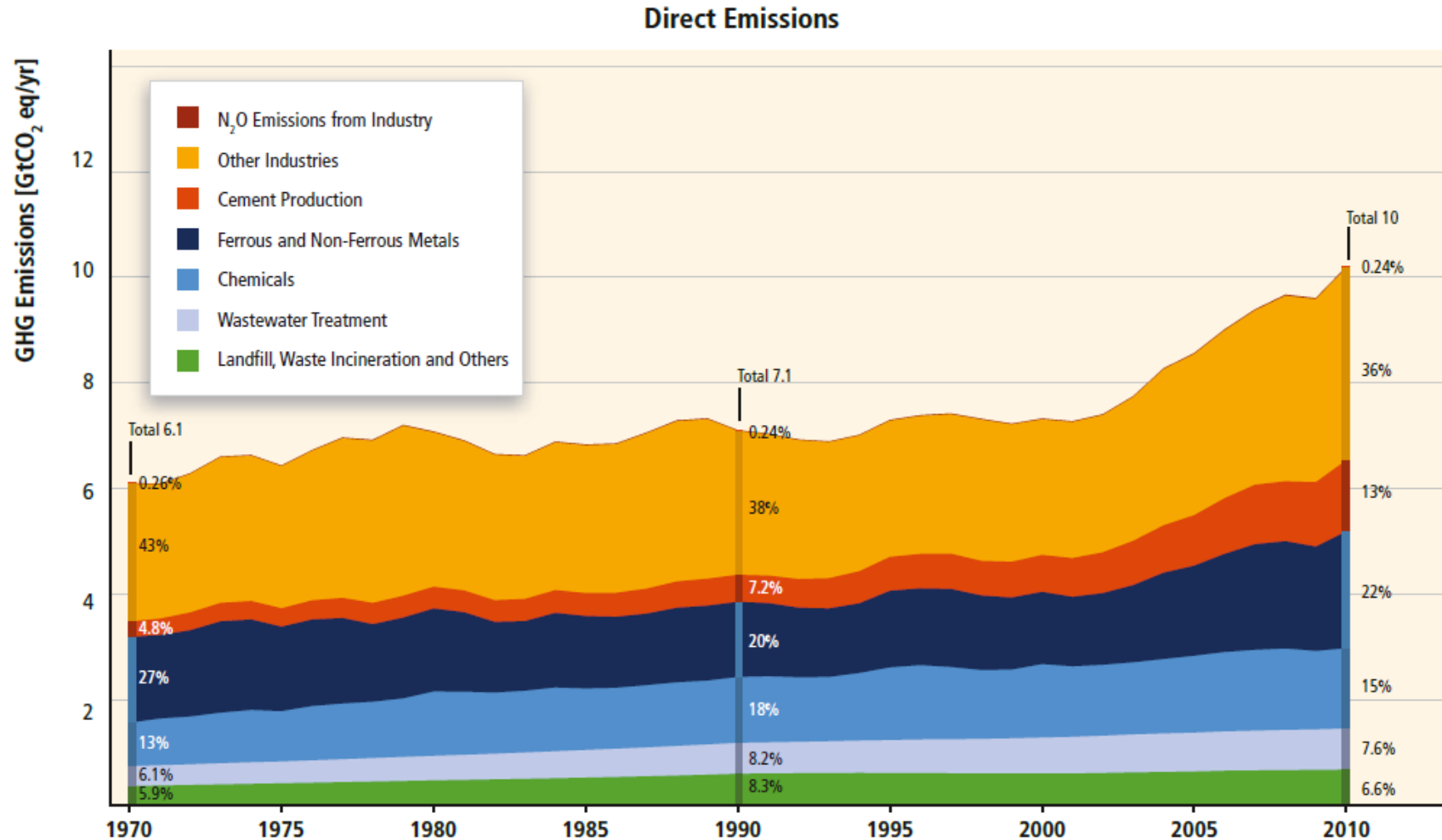
**Industry (including waste) is end-use sector with largest GHG emissions:
32% of global GHG emissions (21% direct plus 11% indirect)**



Source: IPCC AR 5 2015

Where industry related GHG emissions come from (sector and country breakdown)?

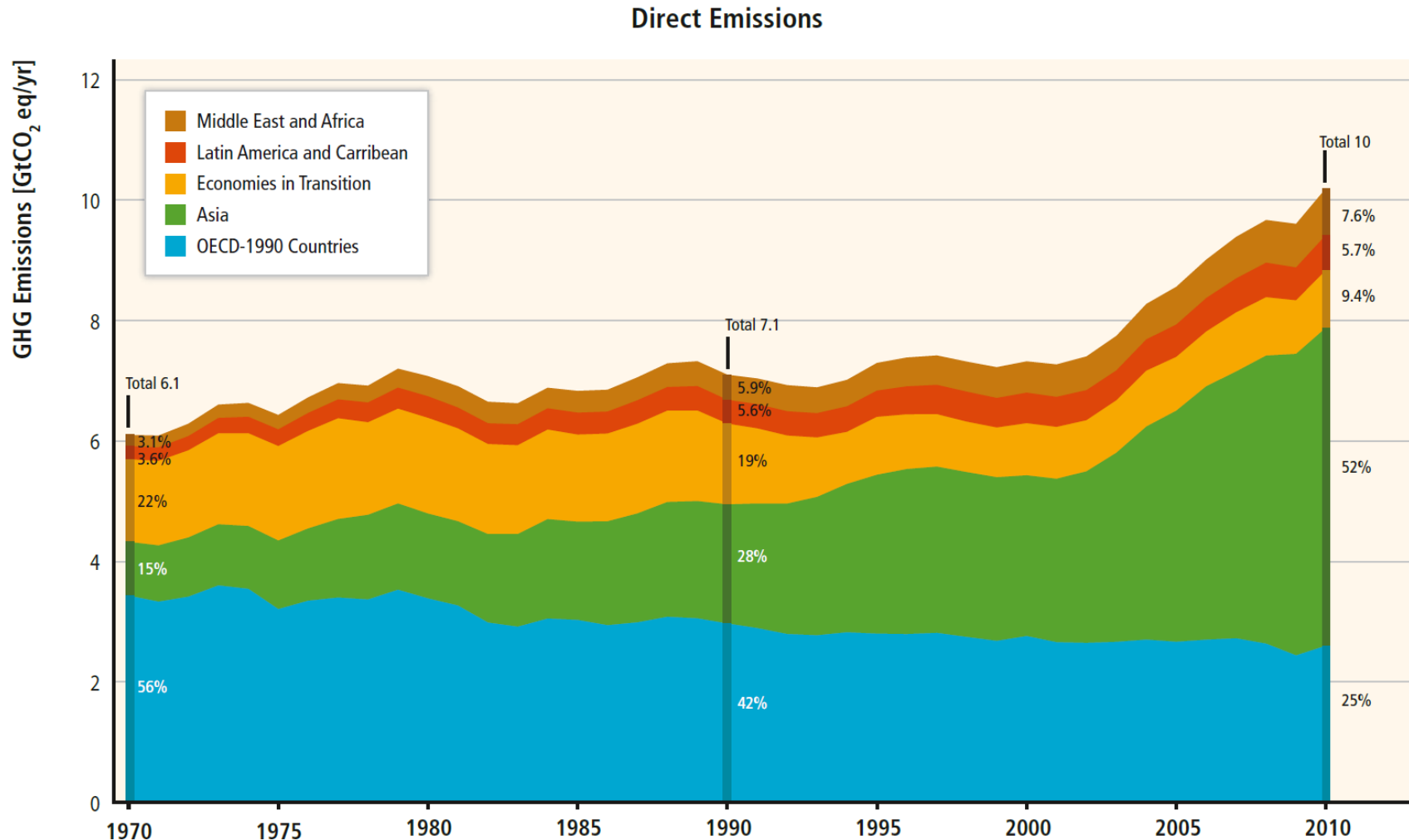
**Industry direct emission trends by sub-sector:
Metals + chemicals + cement industries = ~50% of industry emissions**



Source: IPCC AR 5 2015

Where industry related GHG emissions come from (sector and country breakdown)?

Industry direct emission trends by region: Increasing in Asia and decreasing in OECD with increasing trade of products

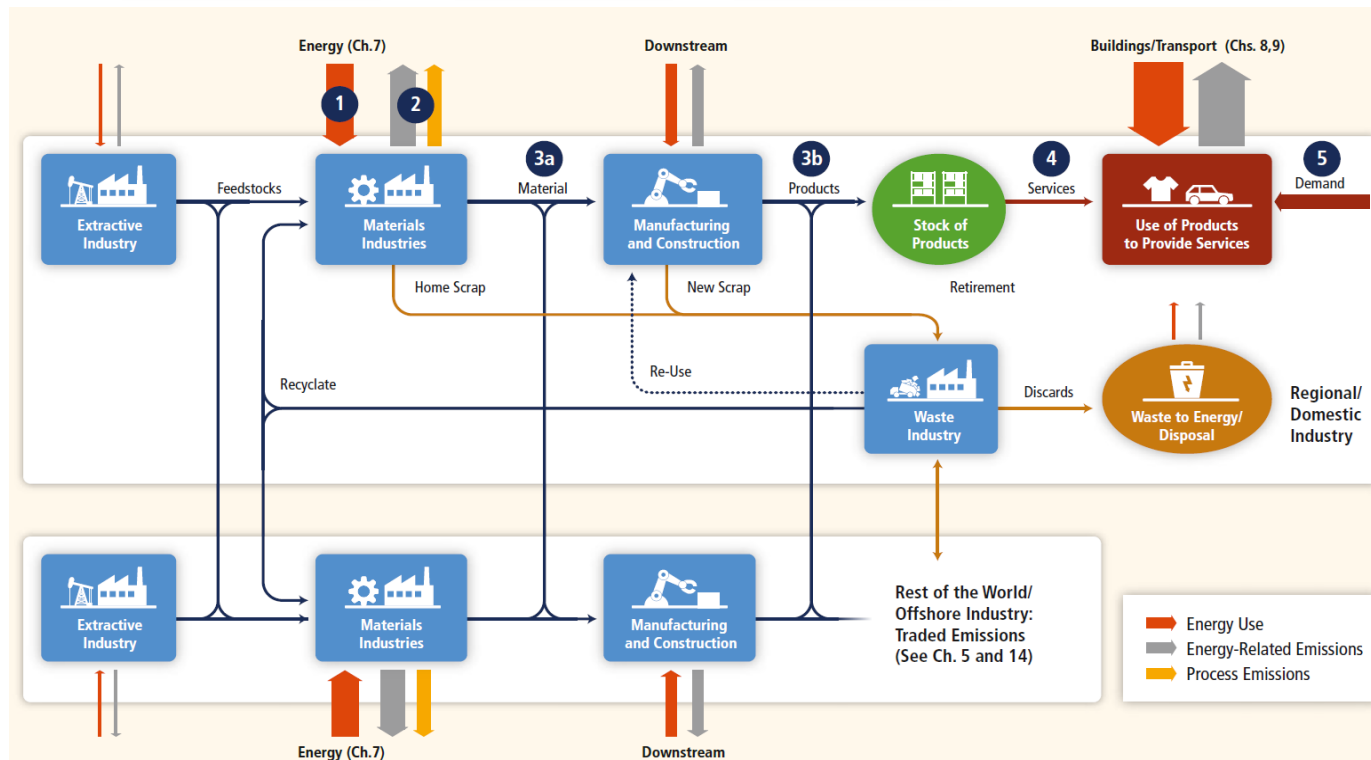


Source: IPCC AR 5 2015

Industry emissions decomposition - five main options for reducing GHG emissions in the industry

$$G = \frac{G}{E} \times \frac{E}{M} \times \frac{M}{P} \times \frac{P}{S} \times S$$

Emissions	Emissions Intensity	Energy Intensity	Material Intensity	Product-Service Intensity	Service Demand
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Industry emissions decomposition - five main options for reducing GHG emissions in the industry

- (1) Energy efficiency (e.g., through furnace insulation, process coupling, or increased material recycling);
- (2) Emissions efficiency (e.g., from switching to non-fossil fuel electricity supply, or applying CCS to cement kilns);
- (3) Material efficiency
 - (3a) Material efficiency in manufacturing (e.g., through reducing yield losses in blanking and stamping sheet metal or re-using old structural steel without melting);
 - (3b) Material efficiency in product design (e.g., through extended product life or de-materialization – product design);
- (4) Product-Service efficiency (e.g., through car sharing, or higher building occupancy);
- (5) Service demand reduction (e.g., less individual mobility switching from private to public transport, sustainable consumption)

Thank you very much for your attention

Further information are available under
www.wupperinst.org

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Ebene 1 – Text Arial fett – soll als Hauptgliederungspunkt eingesetzt werden

Ebene 2 – Text Georgia normal – dieses Format ist für den Fließtext gedacht, in dieser Schriftart sind Auszeichnungen durch Fett- oder Kursivsetzung möglich

➤ **Ebene 3 – Text Arial fett – soll eingesetzt werden wenn bei Hauptgliederungspunkten ein Aufzählungspunkt Sinn macht**

➤ Ebene 4 – Text Georgia normal mit Aufzählung

- Ebene 5 – Text Georgia normal Unteraufzählung 1

Ebene 5 kann auch ohne Aufzählungspunkt eingesetzt werden.

Achtung! Die Aufzählung darf nur an- und abgewählt (Menüpunkt) und nicht eine neue Aufzählung zugewiesen werden (Dropdownliste im Menüpunkt).

- Ebene 6 – Text Georgia normal Unteraufzählung 2

Ebene 7 – dieses Format ist für die Trennlinie vorgesehen, so ist sie reproduzierbar und fließt bei Korrekturen mit dem Text.