# CONSEQUENCES OF A CIRCULAR ECONOMY TRANSITION ON THE STRUCTURE OF THE ECONOMY

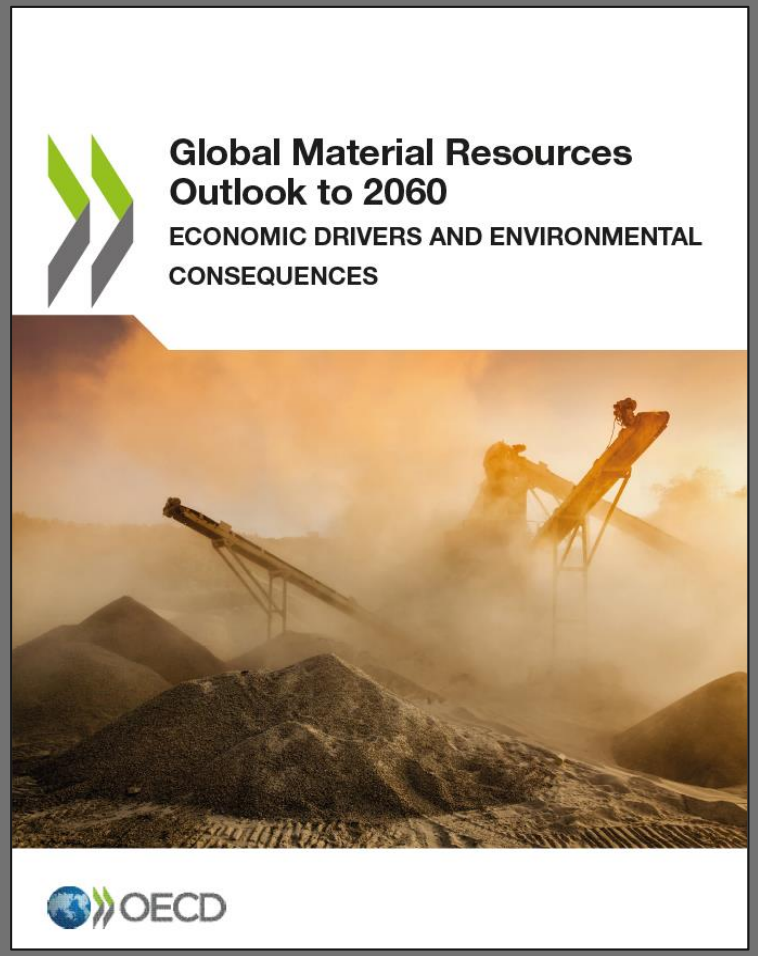
**Rob Dellink**
Senior Economist
Environment Directorate, OECD

Session I, second day
**22 November 2022**

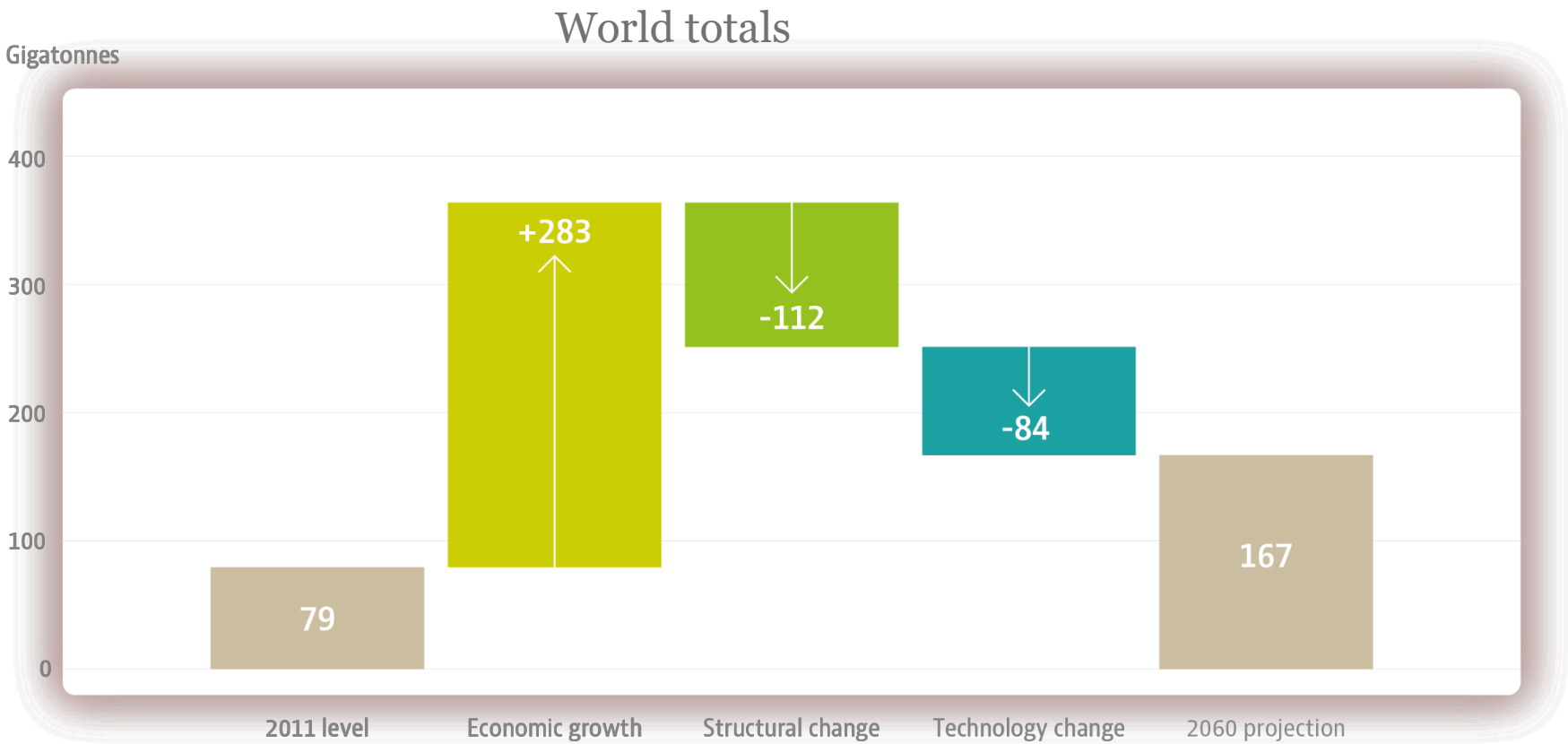
RE-CIRCLE
Resource Efficiency & Circular Economy Project

OECD
BETTER POLICIES FOR BETTER LIVES

# GLOBAL MATERIAL RESOURCES OUTLOOK



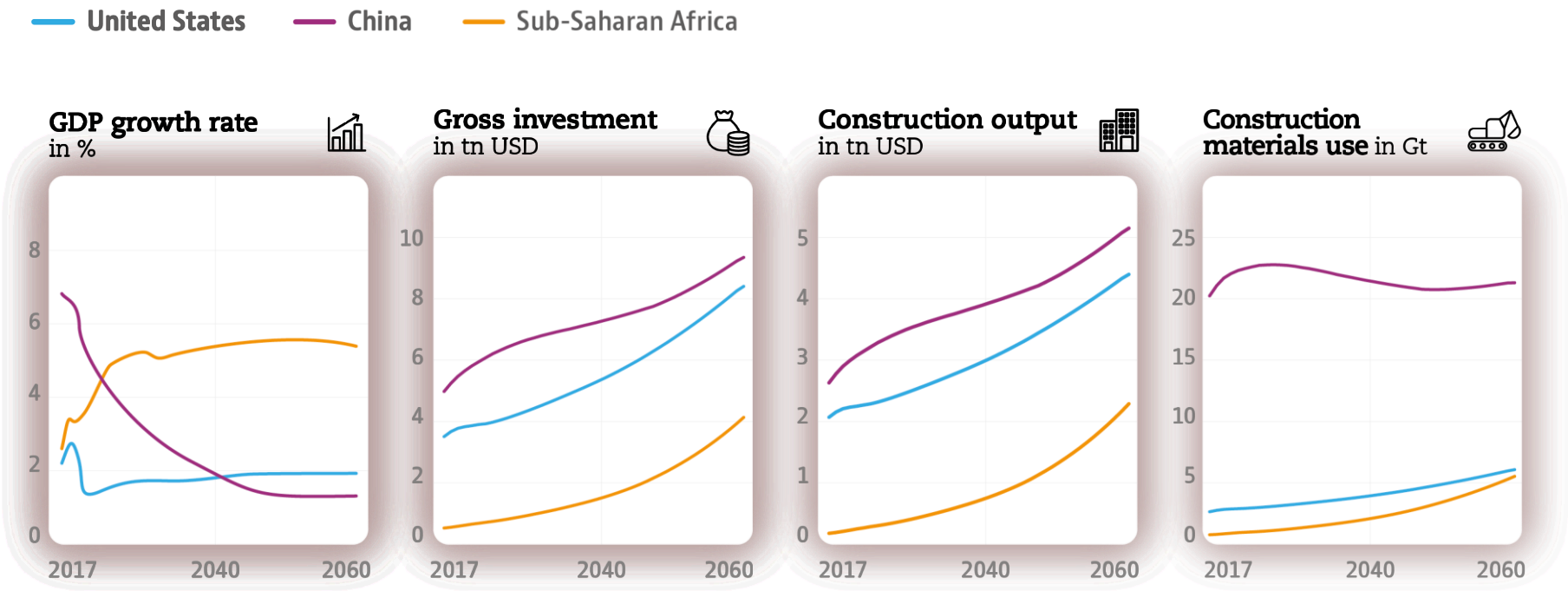
# Competing forces lead to near doubling of materials use




South Africa: ~480 Mt in 2011; ~910 Mt in 2060

*Source*: OECD (2019), Global Material Resources Outlook

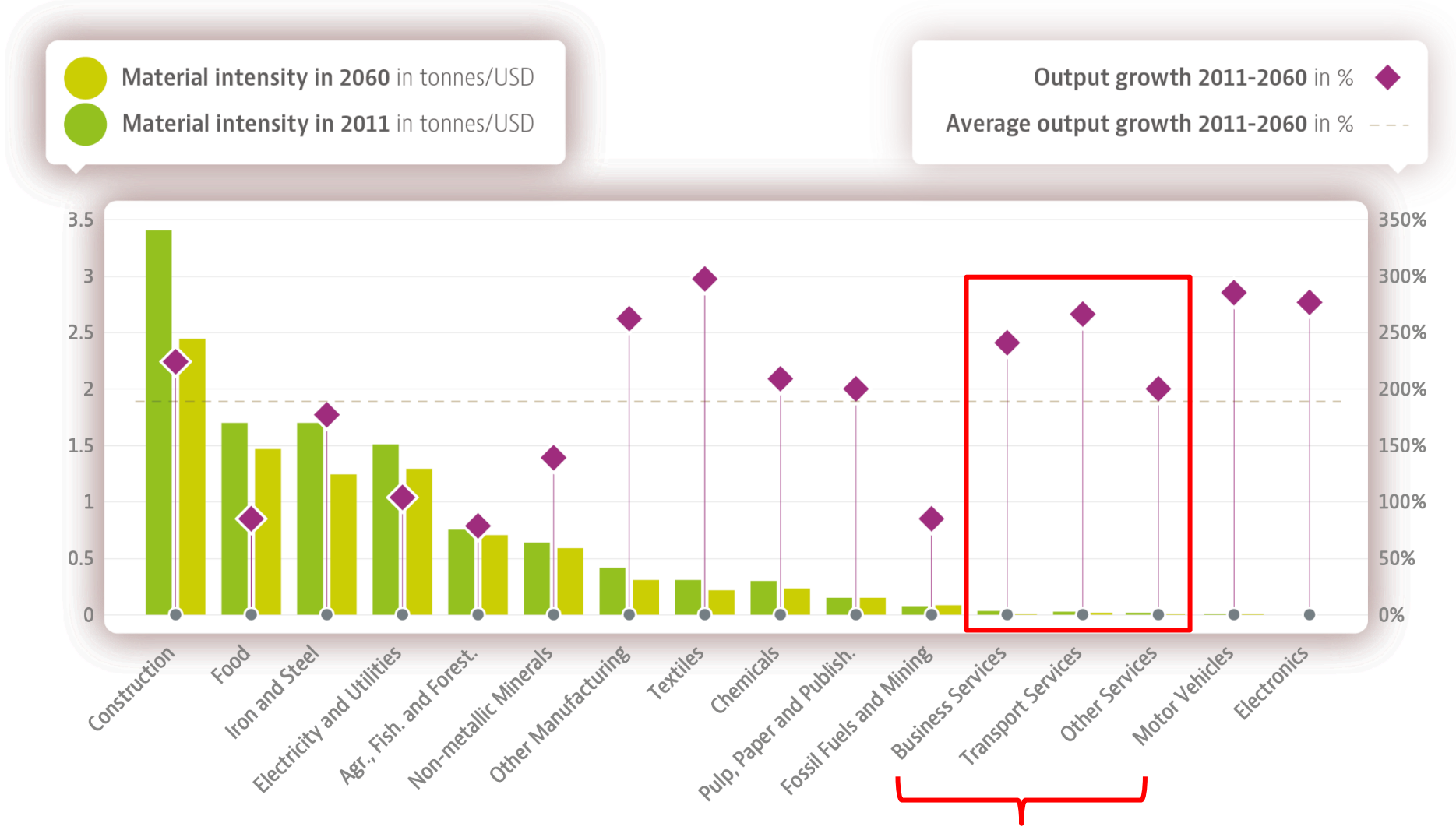
# Investment increases over time and construction follows




N.B. Baseline constructed before Covid-19 pandemic

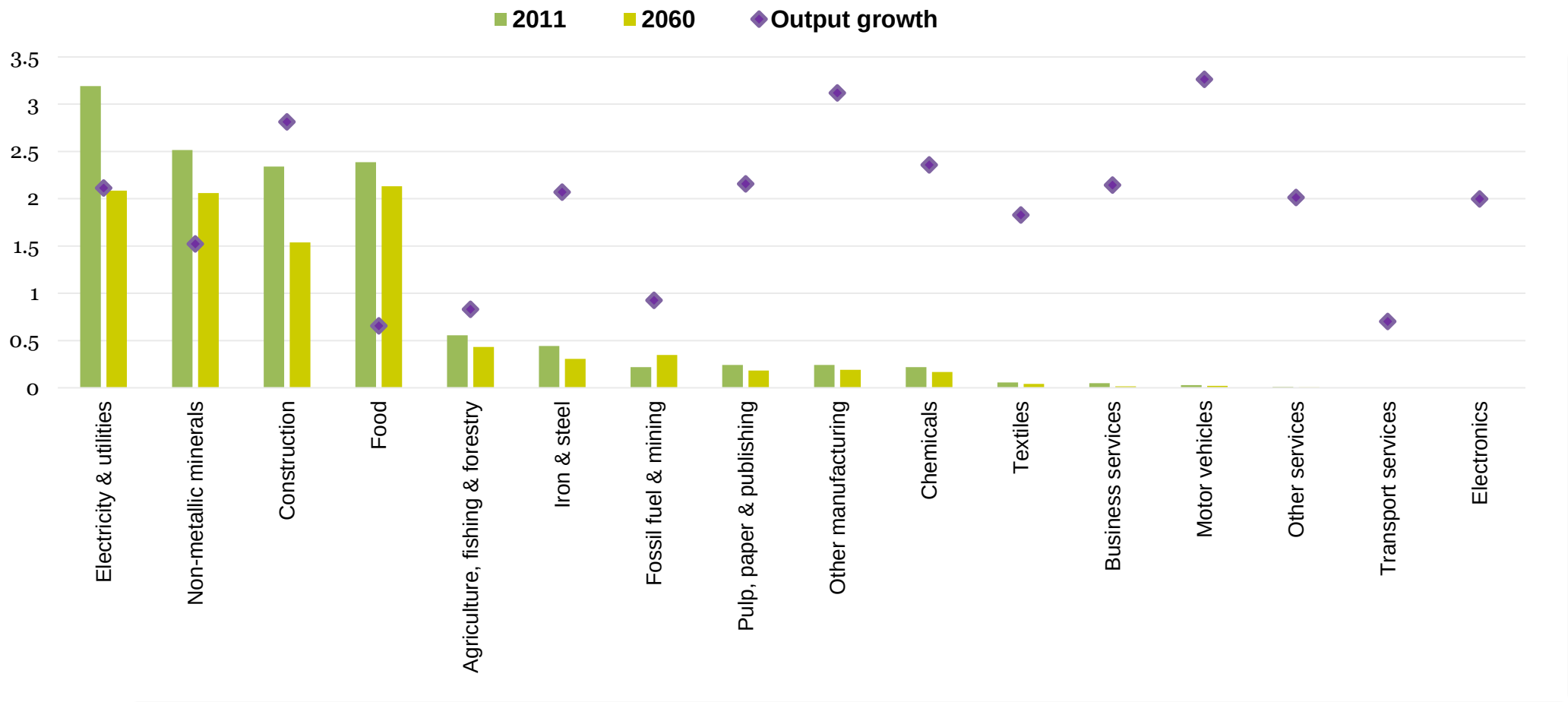
*Source*: OECD (2019), Global Material Resources Outlook

# Structural change shifts activity away from material intensive sectors



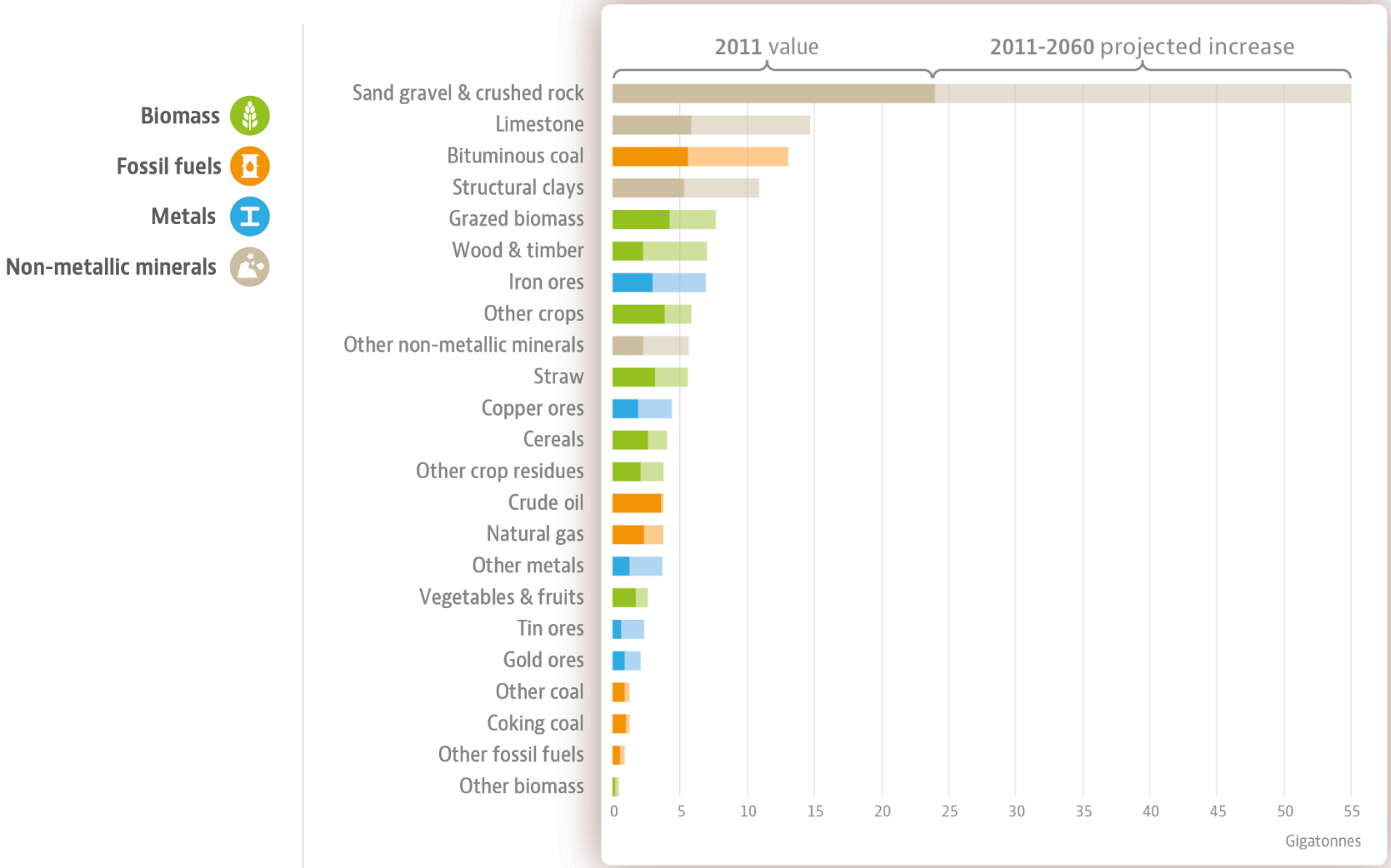

*Source*: OECD (2019), Global Material Resources Outlook

# And for South Africa



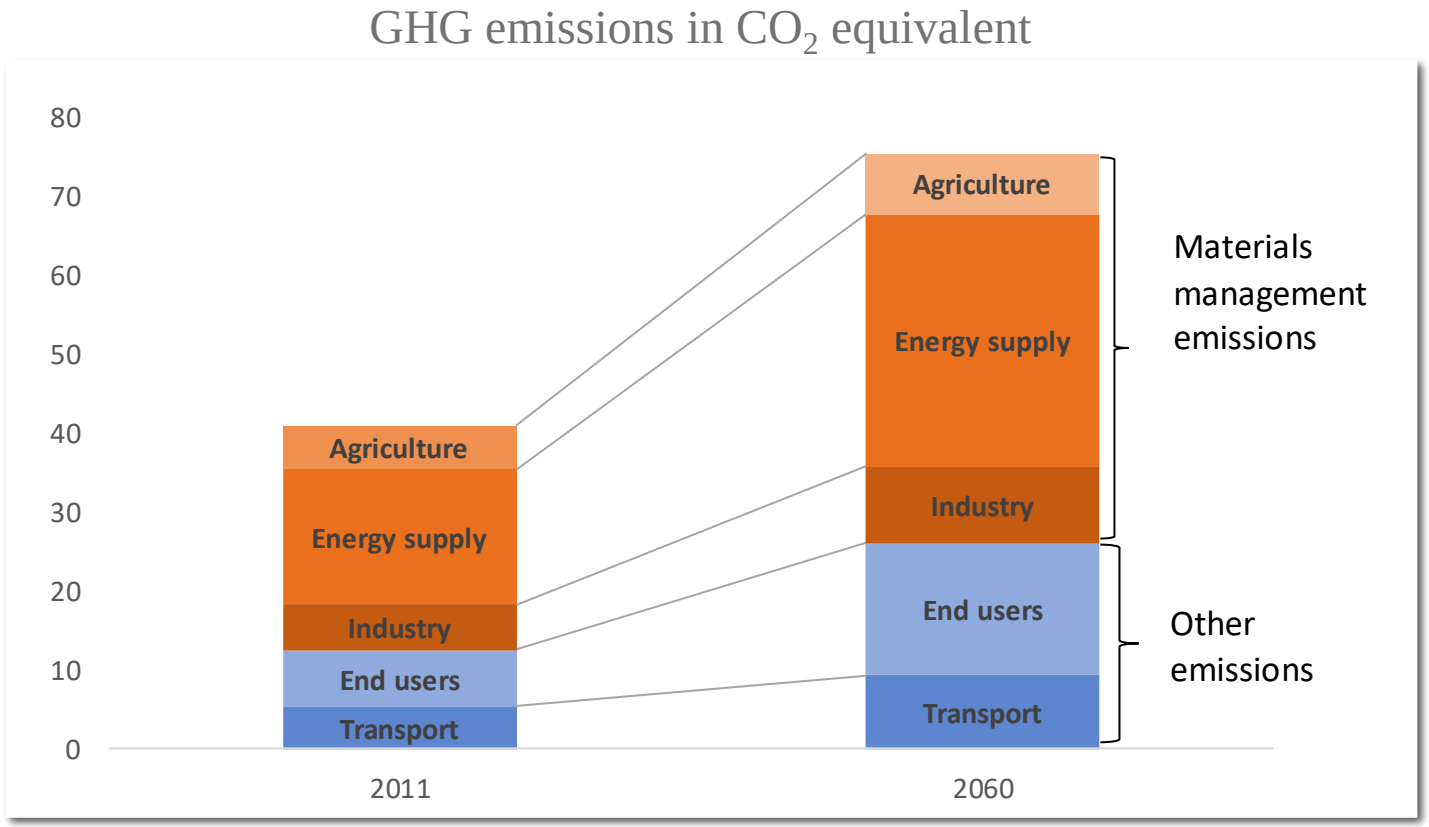

*Source*: OECD (2019), Global Material Resources Outlook

# Growth in material use differs widely across materials




*Source*: OECD (2019), Global Material Resources Outlook

# Greenhouse gas emissions related to materials management will more than double

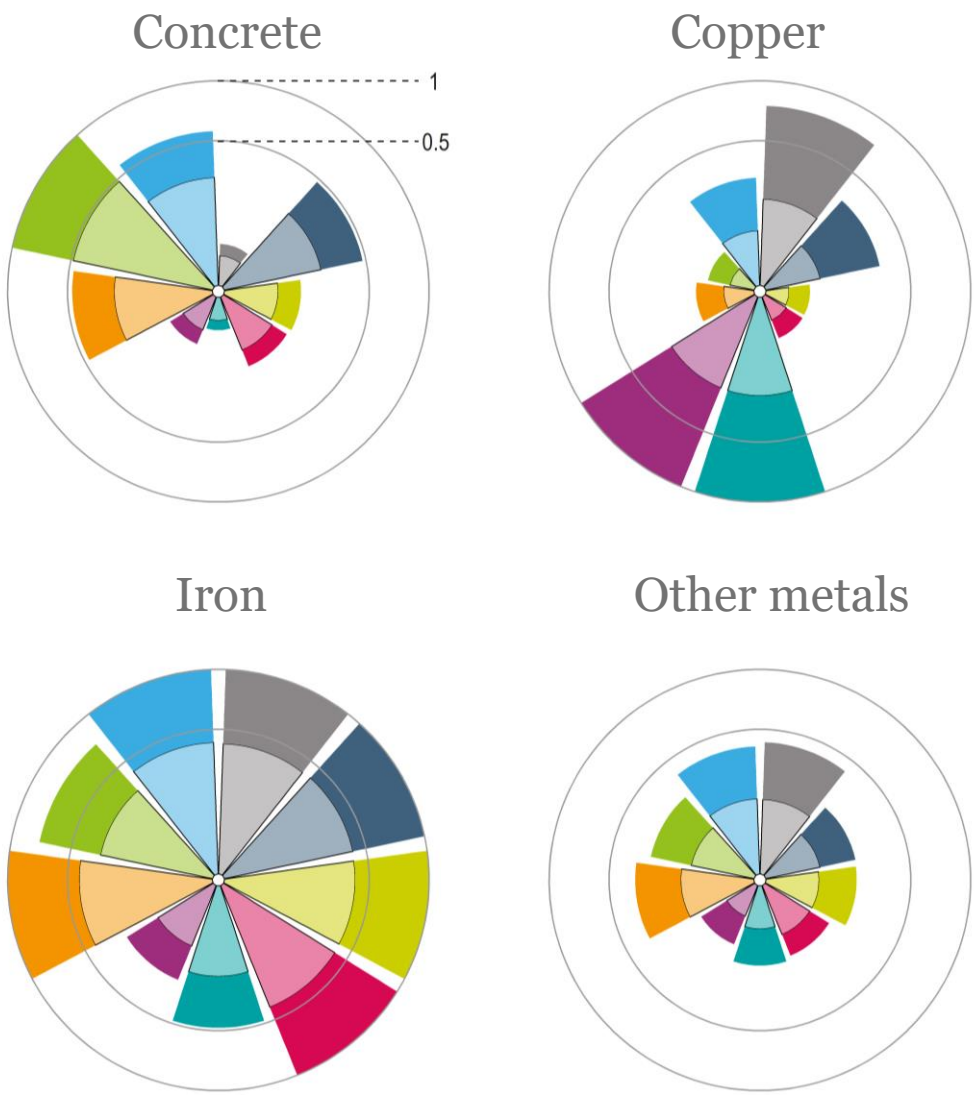


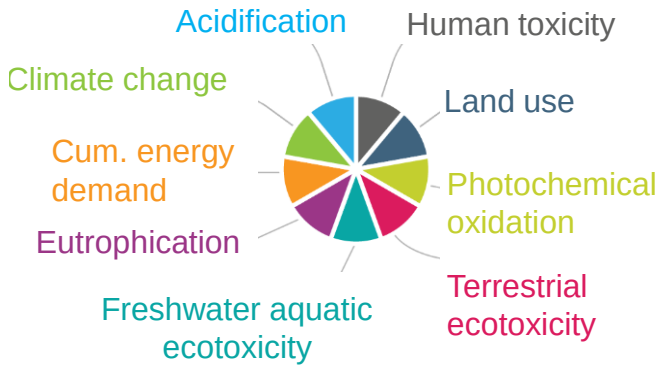

**12%** of total GHG emissions associated with 7 key metals

**12%** of total GHG emissions associated with concrete

**50Gt** $CO_2$ eq emissions associated with materials cycle

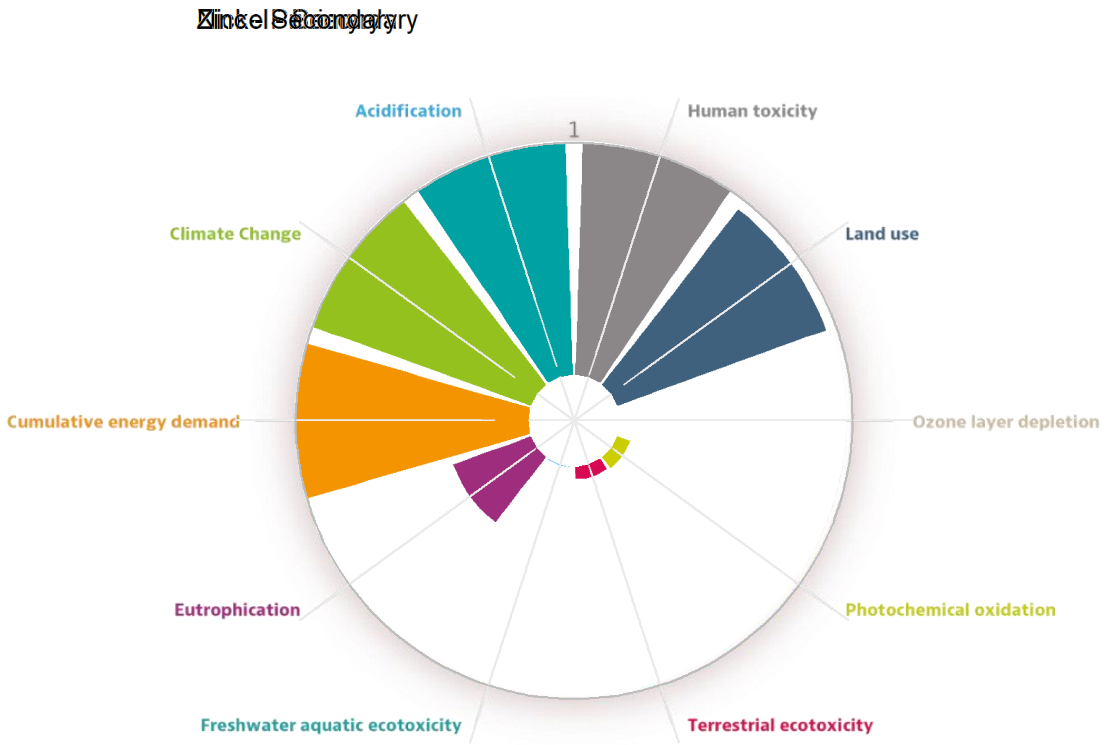
# Environmental impacts from extraction and processing will more than double, but vary widely by material




Total environmental impacts (highest impact in 2060 normalised to 1)

# Primary materials cause much more environmental damage than secondary (recycled) materials




Per kg environmental impacts (highest impact normalised to 1) for 2015

*Source*: OECD (2019), Global Material Resources Outlook

# THE IMPACT OF A GLOBAL MATERIAL FISCAL REFORM

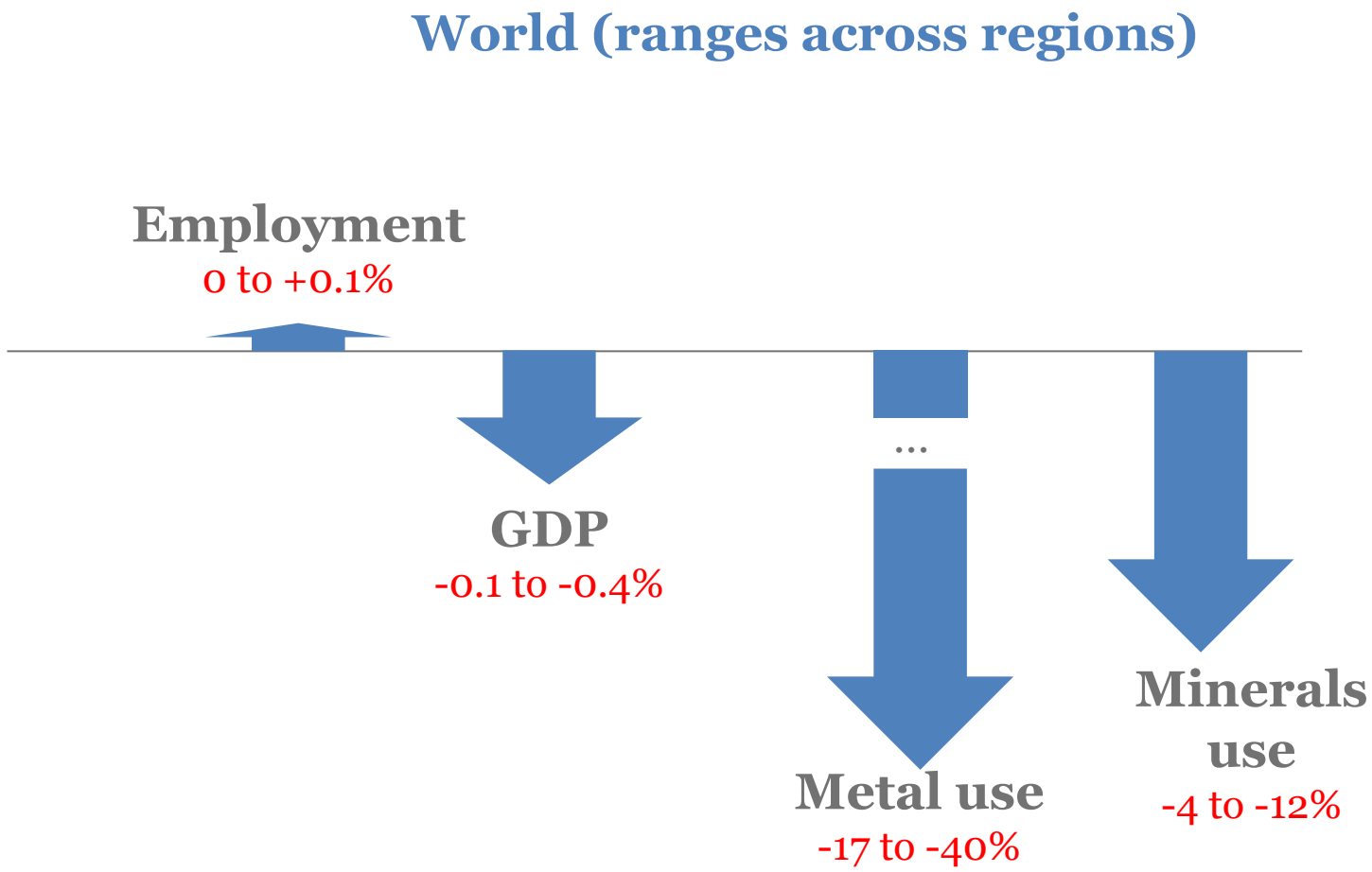
# Material Fiscal Reform (MFR) scenario

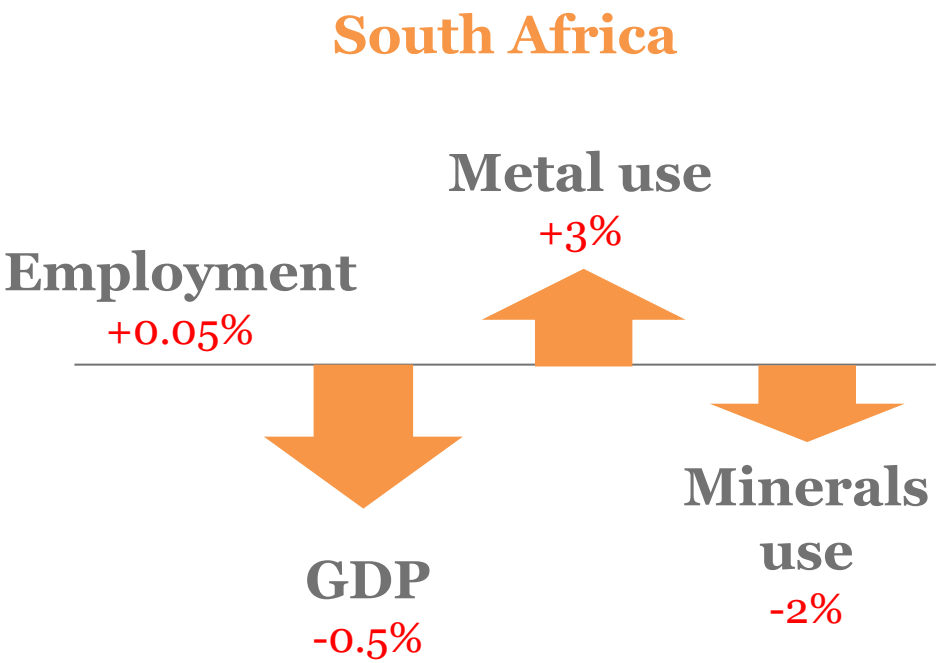
| Instrument | Description | Global Targets (2040) |
|---|---|---|
| Material tax scenario (MTS) | Tax on primary metals and non-metallic minerals | • 10 $/t of iron ores<br>• 50 $/t of aluminium ores<br>• 20 $/t of copper ores<br>• 15 $/t of other metals ores<br>• 5 $/t of non-metallic minerals |
| Subsidy to secondary metal production | Production subsidy to secondary metal production | 75% subsidy rate on the purchasing price of the recycling commodity |
| Subsidy to recycling | Subsidy for recycling input uses | Subsidy on the producer (selling) price of secondary metal - at level that ensures the full package is revenue-neutral. |

- All these fiscal instruments are implemented from 2018 to gradually reach their target in 2040
- Government revenues from the material taxes are used to finance subsidies (MFR) or returned as lump sum transfers (MTS)
- Material taxes are differentiated across countries to account for existing royalties and taxes on mining sectors.

# Results: boosting resource efficiency and boosting employment seems possible

**Percentage changes in 2040 compared to baseline**

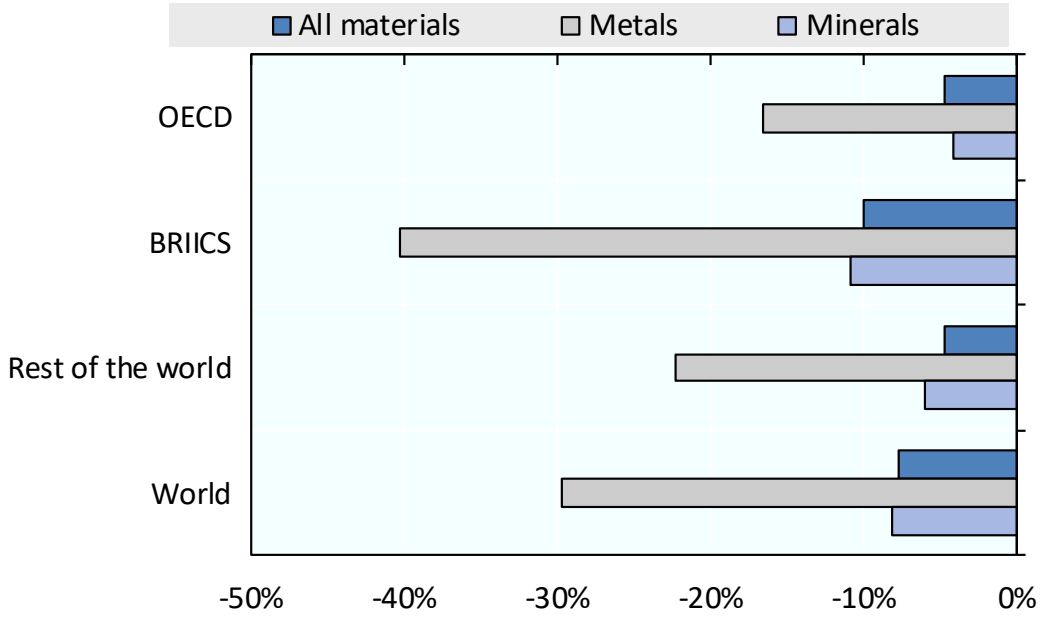


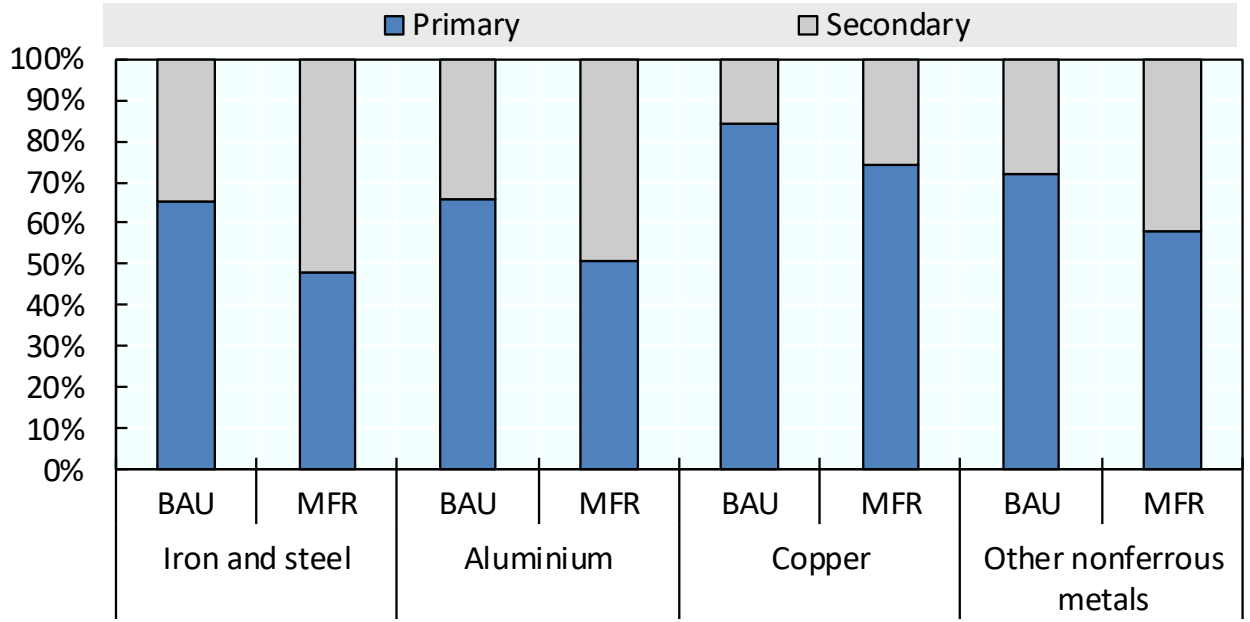
# Policy action can decouple material use and economic growth, but is less easy for minerals than for metals

Percent change in 2040 w.r.t. central baseline scenario; MFR = Material Fiscal Reform scenario

## Metal use reduces more than minerals



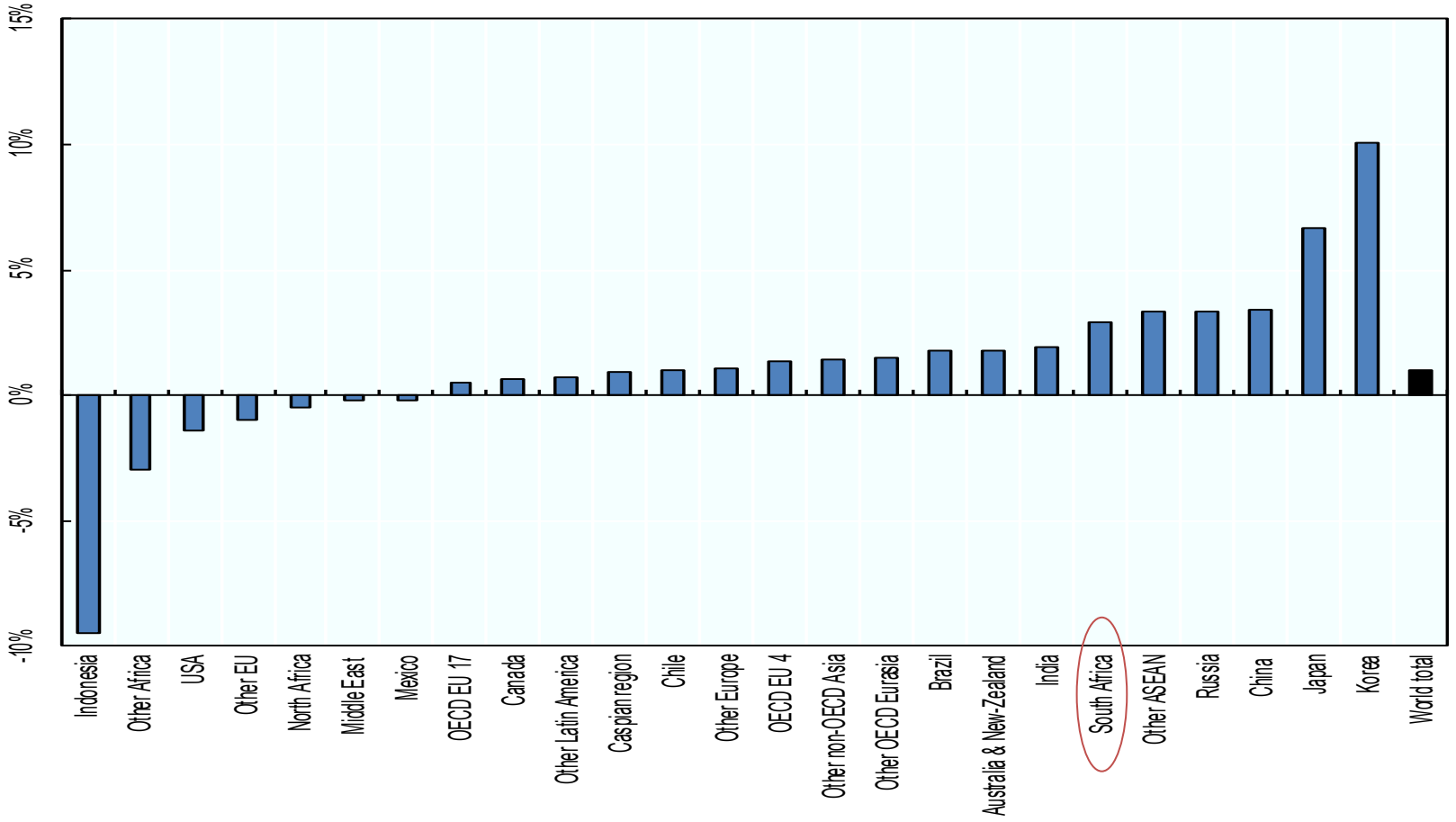

## Metal use shifts from primary to secondary (global)




*Source*: OECD ENV-Linkages model.

# The big mining countries are adversely affected, while other countries seize a comparative advantage

Changes in percentage of real gross output of the mining sector in 2040 w.r.t. baseline.

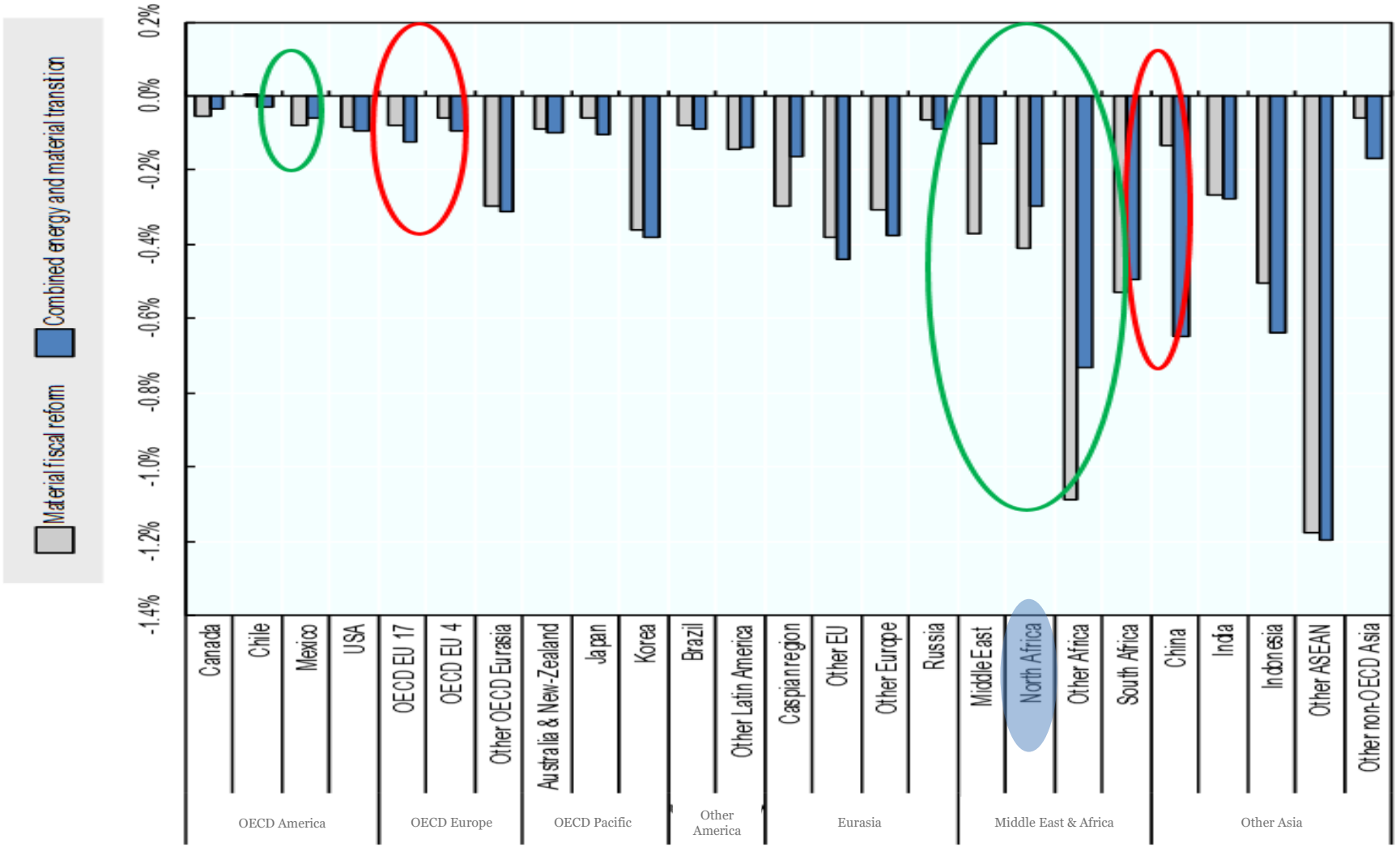



*Source*: OECD ENV-Linkages model.

Material fiscal reform

# The costs of the transition vary by country depending on their economic structure and the implementation of both energy and material transitions

Percent change w.r.t. to respective baseline [a] in 2040




*Note*: These scenarios are compared to their respective baselines.
*Source*: OECD ENV-Linkages model.

Combined energy and material transition

# Policy scenarios: Conclusions

| | |
|---|---|
| Can policy action decouple materials use and economic growth? | • Yes, decoupling occurs through RECE policies at low costs, much stronger for metals than minerals.<br>• Significant increase in circularity for metals. |
| To what extent does this decoupling reduce the environmental impacts of materials use? | • The shift to secondary materials leads to significant reduction in environmental impacts, incl. AP and GHG. |
| What are the synergies and trade-offs between RECE transition and energy transition? | • We found synergies for non-metallic minerals and fossil fuels, but not metal use. |
| Can the RECE transition support an environmental tax reform ? | • Material taxes do not significantly affect government budget but carbon tax does. |
| What are the challenges for the different countries and sectors? | • Countries are facing different challenges in reducing their material uses, so are sectors. |

RE-CIRCLE
Resource Efficiency & Circular Economy Project

# THANK YOU!

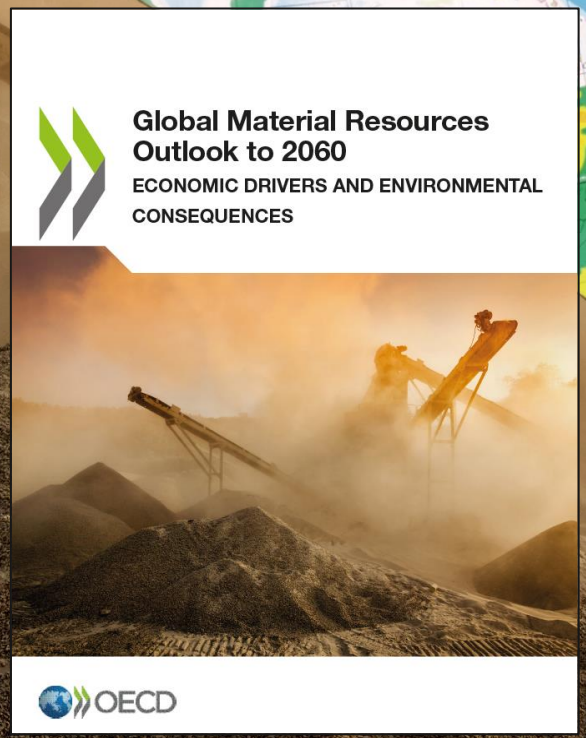

Rob.DELLINK@oecd.org

Peter.BORKEY@oecd.org

Frithjof.LAUBINGER@oecd.org

Nestor.PELECHAAIGUES@oecd.org


http://oe.cd/recircle




OECD
BETTER POLICIES FOR BETTER LIVES